UNDERSTANDING DIFFERENCES IN PAIN-RELATED SUPPORT: COMPARING ATTACHMENT THEORY AND THE COMMUNAL COPING MODEL OF PAIN CATASTROPHIZING

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ABSTRACT

There has been a growing interest in interpersonal factors and/or processes that are relevant to the experience of pain. The communal coping model of pain catastrophizing (CCM; Sullivan et al., 2001) is one of the most prominent theoretical frameworks for investigating the interpersonal aspects of chronic pain. However, attachment theory (Bowlby, 1969) has also emerged as a promising conceptual framework for examining the social aspects of the pain experience (Porter, Davis, & Keefe, 2007). The primary goal of the current research was to compare these conceptual frameworks in terms of their potential for studying and understanding pain-related interpersonal processes. This was achieved by comparing the strengths of the relationships between self-report variables capturing constructs thought to be involved in the development and maintenance of chronic pain (i.e., desire for solicitous support and solicitous support received) and variables relevant to both attachment theory (i.e., attachment anxiety and avoidance) and the CCM (i.e., pain catastrophizing). In order to examine these relationships in both the context of non-chronic and chronic pain, two studies were conducted. Study 1 recruited a non-clinical sample of romantic couples (N = 164), while Study 2 utilized a clinical sample of individuals in a relationship (N = 147) attending a pain clinic.

In comparison to pain catastrophizing, the attachment variables were more strongly associated with all of the solicitous support variables in Study 1 and Study 2. Inconsistent with expectations, attachment anxiety was not consistently related to the desire for solicitous pain-related support or to receiving it, whereas attachment avoidance was consistently related to a relatively lower level of interest in receiving this form of support and to receiving relatively less of this type of support. Pain catastrophizing was less consistently related to the dependent variables. Amongst those not experiencing chronic pain (i.e., Study 1 participants), pain catastrophizing was related to the desire for solicitous support and unrelated to receiving this type of support. Conversely, amongst those with chronic pain (i.e., Study 2 participants), pain catastrophizing was unrelated to the desire for solicitous support but was associated with reports of receiving less of this type of support. The current research highlights the potential of attachment theory, relative to another more frequently investigated theory (i.e., the CCM), for understanding interpersonal variables and processes related to the experience of pain.

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Table of Abbreviations

Abbreviation	Explanation
CCM	Communal Coping Model of Pain Catastrophizing
CPT	Cold-pressor task
ECR-R	Experiences in Close Relationships Questionnaire – Revised
ECR-S	Experiences in Close Relationships Questionnaire – Short Form
MPI	West Haven-Yale Multidimensional Pain Inventory
PCS	Pain Catastrophizing Scale
PDI	Pain Disability Index
PRPQ	Pain Response Preference Questionnaire
PRQ-SS	Pain Response Questionnaire – Support Seeker version
PRQ-CG	Pain Response Questionnaire – Caregiver version
RAS	Relationship Assessment Scale
SSWss	Solicitous support wanted as reported by support seekers
SSWcg	Solicitous support wanted as perceived by caregivers
SSPss	Solicitous support provided as perceived by support seekers
SSPcg	Solicitous support provided as reported by caregivers

Note. All abbreviations listed also have explanations included in text as they appear. List includes abbreviations that occur more than once in the text.

CHAPTER 1: INTERPERSONAL INFLUENCES AND CHRONIC PAIN

Prevalence rates of chronic pain in adults are fairly consistent across countries and are estimated at 18% to 30%. A considerable number of individuals experiencing chronic pain also report significant mental health concerns, employment and financial difficulties, and interference with daily living activities (Breivik, Collett, Ventafridda, Cohen, & Gallacher, 2006; Johannes, Le, Zhou, Johnston, & Dworkin, 2010; Kennedy, Roll, Schraudner, Murphy, & McPherson, 2014; Reitsma, Tranmer, Buchanan, & Vandenkerkhof, 2011). Given the substantial cost of chronic pain to those experiencing it and to society, research focused on understanding chronic pain and factors association with it is highly warranted.

Much of the recent psychosocial research on pain has focused on interpersonal factors and/or processes that are relevant to the experience of pain, including emotional disclosure (Lumley, Sklar, & Carty, 2012), empathy (Cano, Barterian, & Heller, 2008), hostility and criticism (Burns et al., 2013), self-perceived burden (Kowal, Wilson, McWilliams, Péloquin, & Duong, 2012), and social rejection (Eisenberger, Jarcho, Lieberman, & Naliboff, 2006). Of particular note, the social communication model of pain has drawn attention to social factors involved in the experience and communication of pain for both individuals experiencing pain and those observing individuals experiencing pain (Craig, 2009, 2015). In short, the social communication model posits that intrapersonal and interpersonal factors influence: (a) the emotions, thoughts, and behaviours of individuals experiencing pain, and (b) the ways in which individuals decode and respond to the pain expressions of others. Intrapersonal factors are those specific to the individual experiencing pain or to the observer, such as personal history, genetics, socialization, attitudes, and biases. Interpersonal factors are those relating to both members of the dyad, such as the type of relationship between the pair (e.g., parent-child, romantic, friendship) or their responses to each other. The current program of research investigated two separate theoretical frameworks and related sets of variables that are relevant to the social communication model of pain and that could potentially be included within it. The first of these frameworks is the communal coping model of pain catastrophizing (CCM; Sullivan et al., 2001). It was first proposed in 2000 (Sullivan, Tripp, & Santor), and is now one of the most prominent theoretical frameworks for investigating the interpersonal aspects of chronic pain (see Sullivan, 2012). The second framework is attachment theory (Bowlby, 1969). It is an older and more general theory of bonding and emotional regulation that is not specific to the experience of pain. However, it has

also emerged as a promising conceptual framework for examining the social aspects of the pain experience (Porter, Davis, & Keefe, 2007). Both frameworks have generated findings suggestive of interpersonal processes involved in the development and maintenance of chronic pain. For example, variables related to both frameworks (i.e., pain catastrophizing and attachment insecurity) have been studied in relation to similar pain-related interpersonal variables thought to be involved in the development of chronic pain (e.g., receiving solicitous pain-related support). However, variables from these models have seldom been considered together within the same study. The current program of research represents an important advance, as the primary aim was to directly examine which approach is stronger for understanding interpersonal aspects of chronic pain.

This document begins by reviewing the research literature on four topics. First, theory and research pertaining to the role of specific forms of social support in the development and maintenance of chronic pain is reviewed. Secondly, the CCM is outlined along with a review of research related to this model. Third, attachment theory and relevant research related to interpersonal processes and chronic pain is described. Lastly, sex and gender differences pertinent to the proposed research are discussed. Two novel studies are then described and discussed. These studies are the first to compare the relationship strength between several variables thought to play a role in the development and maintenance of chronic pain (i.e., preferences for solicitous support and perceptions of support received) and variables relevant to attachment theory (i.e., attachment anxiety and avoidance) and the CCM (i.e., pain catastrophizing).

1.1 Early Research on Interpersonal Influences on Chronic Pain

Fordyce, Fowler, Lehmann, and DeLateur (1968) proposed that non-medical, behavioural approaches could be used to understand the development and subsequent resolution of chronic pain. The authors employed an operant conditioning model of chronic pain to examine whether pain behaviour (e.g., pain verbalizations, moaning, grimacing, antalgic positions, help seeking of chronic pain patients) is subject to the same modifications (i.e., either increasing or decreasing behaviour using positive reinforcement or aversive consequences) as other behaviour with the use of learning techniques (Fordyce et al., 1968). The study required that healthcare professionals and spouses not reinforce patients' pain behaviours by providing attention or pain medication following expressions of pain or discomfort. Rather than reinforcing pain behaviours,

healthcare professionals and spouses were instructed to socially reinforce the patients by offering attention and praise only after the patients engaged in any form of desired activity (e.g., walking) and as the patients increased their activity levels. Within a 16-week period, participants' observable indices of pain-related disability reduced dramatically. Although the absence of a control group makes it impossible to rule out other explanations for the change, the findings do suggest that pain behaviours are subject to the principles of operant conditioning. This seminal study has engendered a large body of research examining the possibility that romantic partners can influence and reinforce pain behaviours thereby increasing or maintaining pain behaviour and disability. It is important to note that this early behavioural approach was focused solely on observable pain behaviour, and that it was essentially unconcerned with subjective experiences of pain (e.g., Schmidt, 1987). This absence of concern with subjective experiences is one of the main criticisms of the model and of treatment based on the model (e.g., Turk & Flor, 1987; Williams, 2002). Nonetheless, it provided the foundation for several models that incorporate both intrapersonal and interpersonal factors involved in the development and maintenance of chronic pain.

Solicitous support involves an overprotectiveness of the person in pain and aims to avoid the worsening of pain (Newton-John, 2015). Some examples of solicitous support include retrieving medication, urging rest, and taking over tasks or chores (Newton-John, 2015). This type of responding affects the pain experience. Research on the role of solicitous support on the experience of pain has utilized several different methodologies, often in combination with one and other. These methodologies include: (a) patients' self-reports of their significant others' behaviours, (b) significant others' self-reports of their own behaviour, (c) observational studies, and (d) longitudinal studies. The findings of these different approaches used to study solicitous support are reviewed below.

1.1.1 Research Methodology Used to Study Pain-Related Social Support

1.1.1.1 Self-report methodology. Self-report methodology has been the most commonly used approach to examine the influence of romantic partners on pain-related adjustment. Most of this research has used the West Haven-Yale Multidimensional Pain Inventory (MPI; Kerns, Turk, & Rudy, 1985). This measure focuses on pain severity, negative affect, pain-related interference in life categories (i.e., family, marital, work, work-related, and social/recreational), appraisal of support received from family and close friends/romantic partners, and perceived life

control. It also has three scales in which respondents indicate the degree their significant others' respond to their pain behaviours in a solicitous, punishing, or distracting manner. The solicitous response scale includes items that relate to how much respondents perceive their significant others' as responding in a concerned or caring manner towards their pain behaviour (e.g., "Asks me how he/she can help" or "Takes over my chores"). The punishing response scale includes items that relate to how much the respondents perceive their significant others' as responding in a negative way to their pain behaviour (e.g., "Expresses irritation at me"). Lastly, the distracting response scale includes items that pertain to how much the respondents perceive their significant others' as attempting to distract them from their pain (e.g., "Involves me in activities").

Typically, scores on self-reports of solicitous support have been found to be positively associated with pain ratings, pain-related disability, and/or a decrease in activity levels (Boothby, Thorn, Overduin, & Ward, 2004; Campbell, Jordan, & Dunn, 2012; Fillingim, Doleys, Edwards, & Lowery, 2003; Kerns et al., 1985; McGeary et al., 2016; Stroud, Turner, Jensen, & Cardenas, 2006). However, there have been at least four studies that have not found a positive association between solicitous support and disability or decreased activity levels (Flor, Kerns, & Turk, 1987; Lousberg, Schmidt, & Groenman, 1992; Schwartz, Slater, & Birchler, 1996; Wilson, Martire, & Sliwinski, 2017). Punishing responses were theorized to lead to a decrease in pain behaviour, and as such would be expected to be associated with lower levels of disability. Some cross-sectional studies have found such associations (Flor et al., 1987; McCracken, 2005), but several others have found punishing responses to be positively associated with disability and/or lessened activity levels (Burns, Johnson, Mahoney, Devine, & Pawl, 1996; Cano, Gillis, Heinz, Geisser, & Foran, 2004; McGeary et al., 2016; Papas, Robinson, & Riley, 2001). Studies utilizing the MPI have often not included or reported on the distracting responses subscale (Leonard, Cano, & Johansen, 2006; Schwartz et al., 1996; Stroud et al., 2006). In many cases the researchers have not specified why the scale has not been included. However, Campbell and colleagues (2012) suggested that it may be because past studies (Boothby et al., 2004; McCracken, 2005) typically did not find significant associations between that subscale and variables related to pain and disability. However, it should be noted that at least two studies (i.e., Cano, Weisberg, & Gallagher, 2000; Williamson, Robinson, & Melamed, 1997) have found distracting responses to be positively associated with pain severity.

The relationship between responses to pain behaviour and disability has also been investigated using a "significant other" version of the Multidimensional Pain Inventory (Kerns & Rosenberg, 1995). One study found a positive association between significant others' self-reports of solicitous responses and both verbal and nonverbal pain behaviours (Romano, Jensen, Turner, Good, & Hops, 2000). This study also found a negative association between significant others' reports of punishing responses and nonverbal pain behaviour. Another study administered the MPI-significant other version to a sample of 104 couples where one member of the dyad experienced chronic pain and a spinal cord injury (Stroud et al., 2006). This study found no associations between significant other self-reported response type and pain patient disability or depression. The authors speculated that these non-significant findings might have been due to the specificity of the sample's primary pain condition (i.e., spinal cord injury).

1.1.1.2 Direct observation methodology. Studies have also used direct observation methods to examine the relationship between pain-related social support and both reports of pain and pain behaviours in samples of romantic partners. Block and colleagues (Block, Kremer, & Gaylor, 1980) examined the level of reported pain of chronic pain patients attending a pain management program in both a spouse-present and neutral-observer condition. Patients with partners perceived as non-solicitous reported less pain in the spouse-present condition than in the neutral-observer condition. However, the reverse was found with patients who perceived their partners as providing solicitous support. Overall, this pattern of findings suggests that individuals who perceive themselves as having a solicitous spouse report more pain than those that perceive themselves as having a non-solicitous spouse. However, it is unclear whether these differences in reports reflect differences in the intensity and severity of the pain experienced. Another major implication of this research is that it suggests that the presence of others can influence the subjective experience of pain. Thus, the social environment could actively modify the pain experience in important ways.

Romano et al. (1992) investigated whether there were differences in the sequential order of pain behaviours and spousal pain-related social support (i.e., solicitous, aggressive, and facilitative) between couples where one partner had chronic pain (pain couples) compared to couples where neither partner was experiencing pain (non-pain couples). In the context of this study, aggressive responding was defined as verbal responses that demonstrates disapproval or behaviours coupled with facial expressions and/or tone of voice that includes anger, sarcasm or

irritation towards the individual in pain. Conversely, facilitative responding included compliments, praise, encouragement, and/or behaviours coupled with facial expressions or tone of voice that suggested caring towards the individual with pain. Both pain and non-pain couples were video-recorded engaging in common domestic activities (i.e., sweeping, changing bedding, rolling up newspaper, and transporting fake fire logs across a room). Compared to the non-pain couples, spouses of pain patients were more likely to respond solicitously to their partners' nonverbal pain behaviours (e.g., grimacing or wincing, limping, clenching teeth, rubbing the area of pain). Pain patients who received solicitous support from their spouses were more likely to respond to this type of support with nonverbal pain behaviours compared to non-pain control participants. Conversely, pain patients were less likely to respond with nonverbal pain behaviours following an aggressive spousal response. The authors suggested that operant conditioning processes may contribute to the preservation of pain behaviours, as solicitous support appeared to reinforce the displays of nonverbal pain behaviours compared to the aggressive responding which appeared to result in a decrease of pain behaviours. However, they cautioned against considering these findings conclusive.

Another study compared the role of self-reported spousal solicitousness towards pain behaviours in pain and non-pain couples during two cold-pressor tasks (CPT; submerging one's hand and arm in extremely cold water; Flor, Breitenstein, Birbaumer, & Fürst, 1995). During one CPT the participants' spouses were present, whereas during the other the spouses were absent. Participants undergoing the CPT with spouses deemed high in solicitousness were found to have pain threshold levels less than half and tolerance levels 20% lower during the spouse present compared to the spouse-absent condition. In addition, these participants used significantly fewer positive coping statements during the two CPTs. These findings suggest that spousal solicitousness towards pain behaviours negatively impacts coping with pain.

1.1.1.3 Longitudinal methodology. Romano and colleagues (1995) noted that the temporal relationship between solicitous support and disability appeared to suggest that pain-related support precipitated disability. However, due to the cross-sectional design, it could also be that individuals experiencing more disability elicited more interpersonal support. At least one study has used a longitudinal design to investigate the direction of this relationship. It was conducted with a sample of older adults attending day programming at nine treatment centres (Matos, Bernardes, Goubert, & Beyers, 2017). The self-report measure completed by the older

adults assessed the degree that they perceived the staff at these facilities as promoting their autonomy and as fostering dependence. Highly similar to solicitous support, perceived promotion of dependence consisted of performing tasks on an individual's behalf or encouraging the discontinuation of tasks if they appear to be causing pain. The authors found that perceived promotion of dependence predicted pain-related disability at 12 weeks. Although this study focused on support provided by staff at facilities for older adults rather than romantic partners, the findings do suggest that solicitous support precedes the development or worsening of pain-related disability.

1.2 Pain-Support Preferences

Although several studies have demonstrated support for the operant conditioning model of chronic pain, whereby disability is reinforced through solicitous support, this research area has been far from conclusive. A qualitative study of chronic pain patients and their spouses raised the possibility that some studies may have failed to find associations between solicitous support and negative outcomes because they did not consider patients' pain-related support preferences (Newton-John & Williams, 2006). In this study, 46% of the spouses without chronic pain reported responding to their partners' pain behaviours in a solicitous manner. Interestingly, many of the participants with chronic pain indicated that they preferred other types of support, such as encouragement to persevere with tasks, being observed by their partners without them responding, assistance with problem solving, and being deterred from talking about their pain. They also reported that the types of support that would traditionally be conceptualized as solicitous (e.g., offering help and the provision of help) were viewed negatively because they caused pain patients to feel guilty, useless, and burdensome. This pattern of findings suggests that self-report measures designed to capture solicitous support, such as the MPI, may include items that reflect responses that many participants find undesirable and as a result would also be unlikely to reinforce pain behaviour. This limitation could be responsible for the mixed findings pertaining to the operant conditioning model of chronic pain.

Newton-John and Williams' (2006) findings clearly indicated support preferences for individuals with chronic pain are poorly understood. This prompted further research regarding pain-related support preferences and led to the development of the Pain Response Preference Questionnaire (PRPQ: McWilliams, Saldanha, Dick, & Watt, 2009). The most recent version of this measure includes three scales that can be labelled solicitous support (i.e., offering and

providing help), encouragement (i.e., providing assistance in persevering with activities), and suppression (i.e., avoiding or distracting from talking or attending to pain; McWilliams, Kowal, Sharpe, & Dick, 2014). Two studies with samples of chronic pain patients found a positive association between wanting solicitous support and self-reported disability (McWilliams, Dick, Bailey, Verrier, & Kowal, 2012; McWilliams et al., 2014). The authors suggested that this association might have occurred because either: (a) those with a strong desire for solicitous support engage in more pain behaviour in an effort to obtain this type of support and, as a result, experience a reduction in functioning, or (b) those with a strong desire for solicitous support engage in increasing amounts of pain behaviour because the solicitous support they receive is highly reinforcing to them. It is also possible that disability levels influence support preferences, and that those with greater disability want more solicitous support because they have a greater need for such support.

A recent study examined whether the relationship between pain-related support received and disability was moderated by pain support preferences (McWilliams, Kowal, Verrier, & Dick, 2017). Individuals attending a pain clinic reported on the degree of solicitous support, encouragement, and suppression they received, and on the degree to which they wanted those forms of support when experiencing pain. They also provided self-reports of disability and relationship satisfaction. The authors found a negative association between encouragement received and disability that was moderated by encouragement wanted. Further investigation of the moderation effect revealed a low amount of encouragement received at both the low and moderate levels of encouragement wanted, which was associated with higher ratings of disability. The authors suggest that caregiver encouragement might be a protective factor for the development of disability. Interestingly, solicitous support was unrelated to disability, but positively associated with relationship satisfaction. The absence of a relationship between solicitous support and disability is inconsistent with previous findings of positive associations between these variables (Boothby et al., 2004; Campbell et al., 2012; Fillingim et al., 2003; Kerns et al., 1985; McGeary et al., 2016; Stroud et al., 2006) that have been interpreted as supportive of the operant conditioning model of chronic pain. This model of chronic pain posits that the provision of pain-related social support characterized by an overprotectiveness and concerned manner (i.e., solicitous support) results in disability through the reinforcement of pain behaviour. Therefore, the absence of a relationship between the two variables is inconsistent with

the operant conditioning model. McWilliams et al. also suggest that solicitous pain-related support serves to increase relationship satisfaction, which is a more positive function than was previously thought.

1.3 Communal Coping Model of Pain Catastrophizing

Since Fordyce and colleagues (1968) applied the operant conditioning model to chronic pain and suggested that pain-related disability could be influenced by psychosocial factors, such as responses to pain behaviour, several frameworks have been developed to investigate the social aspects of the pain experience. The communal coping model of pain catastrophizing is one of the most well-established of these models. Pain catastrophizing is a multidimensional cognitive construct comprised of rumination, magnification, and helplessness (Sullivan, Bishop, & Pivik, 1995). It was first conceptualized as an intrapersonal cognitive pain appraisal variable that was thought to result in poor pain adjustment and disability through an exaggerated negative orientation to real or expected pain (Sullivan et al., 1995). Pain catastrophizing is considered a trait-like variable and is most often operationalized using the pain catastrophizing scale (PCS; Sullivan et al., 1995). Numerous studies have linked pain catastrophizing with poorer health outcomes such as heightened pain experiences, psychological problems, and disability (Edwards, Cahalan, Mensing, Smith, & Haythornthwaite, 2011; Keefe, Brown, Wallston, & Caldwell, 1989; Sullivan, Stanish, Waite, Sullivan, & Tripp, 1998). Soon after its initial intrapersonal conceptualization, Sullivan and colleagues (2001) proposed the CCM as an interpersonal theoretical framework to account for the relationship between pain catastrophizing and negative pain-related outcomes. They suggested that the goal of high catastrophizers is to communicate distress in order to increase the likelihood that this pain-related distress will be dealt within an interpersonal or social context. They also theorized that the pain-related distress is signalled to others by displays of pain behaviours.

Pain behaviours are defined as any action or body posture undertaken during the experience of pain (e.g., wincing, limping, vocalization) and have been identified as the method by which effective social communication of distress and disability are accomplished (Craig, Versloot, Goubert, Vervoort, & Crombez, 2010; Hadjistavropoulos & Craig, 2002; Sullivan et al., 2001). Several studies prompted by the CCM have demonstrated that those high in pain catastrophizing engage in more pain behaviour relative to those low in pain catastrophizing. This pattern was found in both non-clinical samples experiencing experimentally-induced pain

(Sullivan, Martel, Tripp, Savard, & Crombez, 2006; Sullivan et al., 2000) and in clinical samples (Keefe et al., 2003; Thibault, Loisel, Durand, Catchlove, & Sullivan, 2008). For example, Sullivan, Adams, and Sullivan (2004) conducted the first study to investigate pain catastrophizing and pain behaviour using experimentally-induced pain. They had participants complete a CPT and manipulated the social nature of this task (i.e., observer-present condition vs. observer-absent condition). Participants were also asked to report on the coping strategies they employed, which were coded into four categories (i.e., distraction, positive self-statements, relaxation, and re-interpreting sensations). A composite coping score was then created based on total number of coping strategies used. High catastrophizers displayed significantly more communicative pain behaviours for a longer duration in the observer-present condition. During the observer-absent condition, low and high catastrophizers reported comparable amounts of coping strategies, yet in the observer-present condition, high catastrophizers reported significantly less use of coping strategies, compared to low catastrophizers. These findings suggest that when high catastrophizers are in a social context they try to elicit support from others and engage in less intrapersonal forms of coping.

Similar findings have emerged from research investigating the relationship between pain catastrophizing and pain behaviours in clinical samples. One study found that high catastrophizers were perceived by their partners as experiencing more severe pain and displaying more pain behaviours than low catastrophizers (Keefe et al., 2003). These findings suggest that pain catastrophizers are perceived by their partners as experiencing more pain, which might be attributable to their greater levels of pain behaviours. Thibault et al. (2008) had patients with chronic musculoskeletal pain participate in a simulated lifting task and complete the PCS. The task was used to provoke communicative (i.e., facial expressions, verbal, or paraverbal pain expressions) and protective pain behaviours (e.g., guarding, holding, and running). Their results indicated that even when pain severity was controlled for, pain catastrophizing was associated with increased communicative and protective pain behaviours. These findings are important as they demonstrate that the heightened pain behaviour displays of high catastrophizers are not simply the result of them having higher levels of pain.

Pain catastrophizing has been found to be related to measures of negative affect constructs (e.g., anxiety, depression, neuroticism, worry) and/or negative pain schemas (e.g., pain anxiety, pain helplessness, fear of pain; Quartana, Campbell, & Edwards, 2009). On the

basis of such findings, it has been suggested that rather than having the sole purpose of eliciting interpersonal pain-related support, the pain behaviour of high pain catastrophizers might be social manifestations of distress and negative pain schemas (e.g., Flink, Boersma, & Linton, 2013). An exclusively cognitive conceptualization of pain catastrophizing has been rejected by Sullivan (2012). He argued that pain catastrophizing models that do not consider the social environment are unable to fully explain the construct. Consistent with this view, the CCM continues to generate research regarding social processes involved in pain (e.g., Cabrera-Perona, Buunk, Terol-Cantero, Quiles-Marcos, & Martín-Aragón, 2017; Tomakowsky, Carty, Lumley, & Peters, 2016; Van Denburg, Shelby, Caldwell, O'Sullivan, & Keefe, 2018).

In his most comprehensive review of the CCM and supporting research, Sullivan (2012) further specified that the exaggerated pain behaviours of pain catastrophizers are strategically employed in an attempt to obtain social gains. The five social gains outlined by Sullivan are: (a) proximity to others; (b) empathy or assistance from others; (c) a decrease of others' expectations; (d) a decrease in demands on performance; and (e) interpersonal conflict resolution. The evidence supporting each of these components within the model is reviewed below and followed by a brief critique of the theory and its supporting evidence.

No research has investigated two of Sullivan's five proposed social gains, namely "proximity to others" and "dealing with interpersonal conflict." The other three gains (i.e., empathy or assistance, decrease of others' expectations, and a decrease in demands on performance) are very similar to the concept of solicitous support which involves positive attention and empathetic responses (e.g., expressing sympathy, offering assistance, inquiries relating to the pain experience), decreased expectations (e.g., discouraging activity) and reduced performance demands (e.g., taking over chores or tasks; Romano et al., 1992; Weiss & Kerns, 1995).

As outlined by Sullivan (2012), the CCM does not specifically address whether those high in pain catastrophizing are conscious of their desire for solicitous support. In addition, research based on the CCM has ignored this issue. However, Sullivan's use of the word "strategically" does imply that those high in pain catastrophizing do have a conscious desire for solicitous support. One study indirectly examined this possibility. McWilliams et al.'s (2014) study of chronic pain patients used the PRPQ, a self-report measure of pain-related support preferences, to explicitly ask participants how they want their romantic partner to respond to

them during an episode of pain. A positive association was found between pain catastrophizing and both the solicitous support and suppression scales of the PRPQ. These results are notable for two reasons. First, these findings indicate that high catastrophizing individuals with chronic pain want a high amount of solicitous support, which is consistent with the expectations of the CCM. Second, these findings show that high catastrophizers desire suppressive pain-related support from their partners when experiencing pain. This pattern of findings was unexpected because these two forms of support are seemingly very different from each other. However, McWilliams et al. speculated that high catastrophizers might want those around them to distract them from their pain (i.e., suppression), while also expressing concern and providing support (i.e., solicitous support).

While there has been limited research regarding relationships between pain catastrophizing and self-reported interest in various forms of pain-related support, there have been several studies to investigate pain catastrophizing and perceptions of support received. This research utilized the MPI to assess respondents' perceptions of support received. In a sample of individuals with gastrointestinal cancers and their caregivers (i.e., an individual they depended on for daily assistance), Keefe et al. (2003) reported that caregivers of high catastrophizers were perceived as responding to the pain patients' in a critical manner (e.g., criticizing approach to pain or pain treatment, being argumentative). Similarly, in a sample of chronic pain patients, Boothby et al. (2004) found ratings of pain catastrophizing unrelated to perceived solicitous partner responses. Yet when ratings of pain catastrophizing were examined in relation to perceptions of punishing partner responses, there was a significant positive association. The results of this study can be considered inconsistent with the CCM as higher levels of pain catastrophizing were not linked to higher levels of solicitous partner support but were instead linked with higher punishment. The authors speculated responses to pain may change over time and that this could have had an important impact on their findings. More specifically, they speculated that longer pain duration might result in a decrease in the provision of solicitous support and an increase in punishing responses to pain for individuals high in pain catastrophizing because over time the support providers may become irritated or annoyed by their partners' pain catastrophizing. The authors also suggest that the caregivers may begin to view the pain behaviour of high catastrophizers as manipulative and maladaptive, and that this could motivate the punishing responses of caregivers.

Two studies have examined pain duration as a moderator of the relationships between pain catastrophizing and chronic pain patients' perceptions of responses to pain behaviour. Cano (2004) found that pain catastrophizing was positively associated with perceptions of solicitous support provided by significant others. This association was present amongst those with shorter pain durations, but not amongst those with longer pain durations. Buenaver, Edwards, and Haythornthwaite (2007) conducted a similar study, but also considered the role of social support. In that study, pain catastrophizing was positively associated with both solicitous and punishing responses. The positive association between pain catastrophizing and punishing responses was moderated by perceptions of the amount of social support provided. Amongst those reporting a low level of social support, pain catastrophizing was positively associated with perceptions of punishing responses. Amongst those reporting high social support, this association was weaker. Of direct relevance to the current program of research, pain duration moderated the association between pain catastrophizing and solicitous partner responses. A stronger association was found amongst those with a shorter history of pain.

To summarize, four studies with chronic pain patients have examined pain catastrophizing and their perceptions of pain-related support. The two that did not consider pain duration suggest that those high in pain catastrophizing tend to elicit negative responses from their partners. The two studies that considered pain duration as a moderator suggest that those high in pain catastrophizing are more likely to elicit solicitous responses, but the strength of this relationship diminishes with increased chronicity. The reason for this moderating effect of pain duration has not yet been explored. However, Cano (2004) suggested several explanations. She speculated that individuals with chronic pain may become accustomed to receiving a certain amount of support from their partners and thus over time they perceive themselves as receiving less support even though the amount of support has remained the same. The opposite was also suggested, whereby the spouses themselves become accustomed to their partners' catastrophizing and provide less support. Lastly, Cano suggested that spouses might become annoyed by their partners' catastrophizing and their own inability to decrease the degree that their spouses focus on their pain, which results in them becoming less attentive and responsive to their partners. The result of this reduction in attentiveness and responsiveness is that the relationship between pain catastrophizing and solicitous support disappears.

1.3.1 Pain Catastrophizing and Caregiving

While a relatively large body of research has focused on pain catastrophizing of those experiencing pain, there is a paucity of research investigating the pain catastrophizing of caregivers. One study explored pain catastrophizing in romantic relationships where one partner in the dyad experienced chronic pain (Gauthier et al., 2011). Both partners completed the PSC. Individuals with chronic pain engaged in an activity while their partners observed. The findings indicated that high pain catastrophizing individuals with chronic pain with low pain catastrophizing partners displayed higher levels of pain behaviour than high pain catastrophizing individuals with chronic pain and high pain catastrophizing partners. The authors theorized that this might be due to the propensity of low catastrophizing observers to undervalue the severity of their partners' pain and a related tendency of the high catastrophizing partners to increase their pain displays in order to convey their pain experience to their partners. These findings suggest that both partners' pain catastrophizing is relevant to the study of interpersonal factors and/or processes associated to the experience of pain. This is the only study that has investigated pain-relevant interpersonal variables in relation to the pain catastrophizing levels of both partners' (Gauthier et al., 2011).

1.4 Attachment Theory

Several researchers have suggested that attachment insecurity may underlie both pain catastrophizing and interpersonal pain-related behaviours (Ciechanowski, Sullivan, Jensen, Romano, & Summers, 2003; McWilliams & Holmberg, 2010). Attachment theory is based on the idea that individuals engage in attachment behaviours (e.g., proximity-seeking, vocalizing distress, staying close) throughout their lifespan (Bowlby, 1969; Mikulincer & Shaver, 2009; Shaver & Mikulincer, 2007). These attachment behaviours ensure closeness with attachment figures who provide care and protection. Individuals' interactions with primary attachment figures in the early stages of life are thought to result in individual differences in attachment and are thought to set the foundation for future interactions with attachment figures (Shaver & Mikulincer, 2007).

Attachment characteristics have long been considered relatively stable from childhood to adulthood. Longitudinal research has supported this idea of attachment style stability with significant moderate concordance rates of 61% to 74% (Grossmann, Grossmann, & Kindler, 2005; Hamilton, 2000; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). It is important

to note several longitudinal studies have not found attachment continuity between childhood and adulthood (Lewis, Feiring, & Rosenthal, 2000; Weinfield, Sroufe, & Egeland, 2000). However, one meta-analysis on the longitudinal literature (n = 27) on attachment stability into adulthood concluded that attachment was moderately stable from birth until the age of 19 (Fraley, 2002). These findings are consistent with other studies that have examined attachment stability into later adulthood (Fraley & Brumbaugh, 2004; Klohnen & Bera, 1998).

Individuals can be characterized in terms of their degree of attachment security. Positive experiences with attachment figures, including physical and emotional availability, delivery of necessary support, and responsivity to proximity-seeking generally result in secure attachment (Mikulincer & Shaver, 2009). Secure attachment involves the belief that attachment figures are available for support and that, in general, social support can be relied on to manage distress (Meredith, Ownsworth, & Strong, 2008; Mikulincer & Shaver, 2009). Furthermore, securely attached individuals are more likely to offer social support, to respond empathetically to individuals in need, and to have lower levels of personal distress (Mikulincer & Florian, 1995; Mikulincer et al., 2001). If attachment figures are not responsive (i.e., they do not provide support or provide only inconsistent support) a sense of insecurity is thought to develop (Mikulincer & Shaver, 2003). Attachment insecurity involves negative beliefs about the social environment (e.g., others are untrustworthy) and negative beliefs about the self (e.g., I am unable to cope with threats; Mikulincer & Shaver, 2003).

Research on adult attachment initially focused on the categorical classification of specific attachment styles or prototypes (e.g., secure, anxious, and avoidant). More recently, research has focused on attachment dimensions, most often labeled anxiety and avoidance, rather than specific attachment styles. Although most research now utilizes these dimensions, the specific attachment style names are often used to describe particular combinations of low and high anxiety and avoidance. Using the two-dimension conceptualization of attachment, secure attachment is situated in the space of low anxiety and low avoidance. Insecure attachment involves high anxiety and low avoidance (viz., preoccupied attachment), low anxiety and high avoidance (viz., dismissing attachment), or both high anxiety and avoidance (viz., fearful attachment; Bartholomew & Horowitz, 1991; Mikulincer & Shaver, 2003).

1.4.1 Secondary Attachment Strategies

The function of the attachment system is to determine when to select, initiate, or

terminate behaviour that is directed at finding and attaining support from an attachment figure. In contrast to those with secure attachment, individuals with insecure attachment generally have difficulty seeking support to regulate affect and carry out the primary function of the attachment system. Instead, they use other strategies, known as secondary attachment strategies, to regulate affect (Main, 1990). These secondary attachment strategies, hyperactivation or deactivation, are described below. The following descriptions are based on Mikulincer and Shaver's (2003) comprehensive review of attachment theory.

1.4.1.1 Hyperactivation. Hyperactivation strategies are used to continue seeking proximity to an attachment figure when attachment needs have been thwarted. They are commonly used by those with anxious attachment (Mikulincer & Shaver, 2003). Anxiously attached individuals (i.e., those high on the attachment anxiety dimension) will still attempt to attain love and support (e.g., physical and emotional closeness) from an attachment figure even in the instances where that attachment figure has previously failed to provide the necessary support, responsiveness, and protection. Hyperactivation involves escalating the proximity-seeking attempts made towards the attachment figure. If the attachment figure does not provide what is required, the hyperactivating individual will attempt to force support and attention, even after multiple experiences of attachment figure inaccessibility. In situations where the attachment figure does provide enough support, the hyperactivating individual is likely to present as smothering or overbearing (Shaver & Mikulincer, 2007).

Many of the tactics used to attain proximity (e.g., hypervigilance, fixation, motivation) are similar to what would be used temporarily by more securely attached individuals attempting to obtain proximity. However, when employed by an anxious individual these tactics are exaggerated because the attachment system has gone into overdrive and is constantly activated until the attachment figure is recognized as available. An attachment system in overdrive causes both an exaggeration of perceived threats and an excessive attentiveness to attachment figure availability. This results in a greater chance that any actual or fictional indications of significant others' displeasure, decreased fondness, or imminent leaving will be detected. Multiple experiences with attachment figure unavailability can result in hyperactivation solidified as the primary strategy used to regulate distress. Interpersonally, this presents as: (a) an increased need for nearness and security with a significant other; and (b) a fixation on the availability of a significant other. Research has also found that anxiously attached individuals pay more attention

to the emotions of others. The findings of Fraley, Niedenthal, Marks, Brumbaugh, and Vicary (2006) provide examples of this tendency. In three separate studies, participants were shown movies of faces in which an emotional facial expression slowly changed to a neutral one or the reverse where a neutral expression changed to one displaying emotion (i.e., morph movie paradigm). Participants were then asked to recognize the exact moment the facial expression progressed from an emotional expression to a neutral expression, and to identify both the offset and onset of emotional facial expressions and the emotion displayed in the morph movie. Fraley et al. found that highly anxious individuals were significantly more likely to identify the onset and offset of the facial emotions earlier than participants lower in attachment anxiety. Highly anxious individuals were also quicker in judging the onset of the emotion. However, attachment anxiety was negatively associated with judging the emotional expression correctly. These findings suggest that anxiously attached individuals pay closer attention to the emotions of those around them but are incorrectly interpreting these emotional expressions.

There are two main contributing factors to the persistence of hyperactivation as the primary affect-regulation strategy for anxious individuals. First, anxious individuals do not believe that others are good-natured or trustworthy. Second, these individuals do not believe they are able to handle distressing situations and potential threats on their own. Previous experiences with unreliable and unsupportive attachment figures can cause new circumstances and relationship partners to be viewed through the lens of past attachment injuries. When confronted with a threat, anxiously attached individuals are said to rely on "emotion-focused coping" to manage that threat. Emotion-focused coping is a hyper-focus on internal signals of distress, which includes magnification and rumination of negative emotions and cognitions, self-focused worries and criticisms, and distress-related presentations (Lazarus & Folkman, 1984). Consequently, cognitions and emotions involving threats are easily accessible to anxiously attached individuals, and suppression of such distressing material is neither possible nor preferred (Mikulincer & Shaver, 2003). Research investigating attachment system activation using experimentally-induced stress has found support for this idea. More specifically, several studies found anxiously attached individuals to be hyper-focused on negative emotions and cognitions in both threatening and neutral contexts (Mikulincer, Birnbaum, Woddis, & Nachmias, 2000; Mikulincer, Gillath, & Shaver, 2002).

Mikulincer and Shaver (2003) highlight several ways in which romantic relationships can

be negatively affected by persistent hyperactivation. In particular, there are four main issues that can arise. First, an overreliance on one's significant other for reassurance can damage the development of a mature mutual relationship. Second, an extreme need for attention and support can result in prolonged feelings of frustration and dissatisfaction in the hyperactivating individual. Third, interpersonal conflicts are often exaggerated by the hyperactivating individual, leading to negative emotion and conflict intensification. Fourth, constant attempts at attaining support and attention can cause relationship partners to feel ill-treated, which can result in the rejection of proximity-seeking behaviours and attempts made to create separation between themselves and the hyperactivating romantic partner.

1.4.1.2 Deactivation. Deactivation strategies are a response to the unavailability of an attachment figure in childhood that involves ceasing proximity-seeking activities and attempting to prevent attachment system activation (Mikulincer & Shaver, 2003). This secondary strategy is characteristic of those with avoidant attachment. Such individuals will respond to any threats to the attachment system by avoiding help and engaging in "compulsive self-reliance" (Bowlby, 1969; Mikulincer & Shaver, 2003). Thoughts regarding threats and attachment figures are avoided because they can cause the attachment system to reactivate. Following a similar path as hyperactivation, the outcome of multiple experiences with unavailable attachment figures coupled with a negative assessment of proximity-seeking feasibility results in deactivation being solidified as the primary affect-regulation strategy. In situations where adequate support is provided by the attachment figure, the deactivating individual may present as controlling or lacking emotion (Shaver & Mikulincer, 2007). Deactivation strategies includes a negative belief regarding the ability of the significant other to provide security. The use of deactivation requires suppression of feelings related to diminished self-control and also the belief that one is capable of managing distress. It is necessary to believe that the self is capable of managing the distress to achieve self-reliance. Consequently, an increased belief in one's self-efficacy results from the use of deactivation strategies.

The strategy of the primary attachment system when confronted with a threat is to locate interpersonal support. However, deactivation strategies represent the inhibition of the primary attachment strategy. This can be observed in the two main interpersonal goals specific to the long-term use of deactivation strategies. Firstly, individuals strive for the separation between self and others, control over their surroundings, and self-reliance. This is achieved by avoiding

emotional involvement as much as possible, such as intimacy, dependence, self-disclosure, and curbing any associated relational attachment-type thoughts and emotions (e.g., interconnectedness, intimacy, and harmony). Secondly, individuals shun negative emotions that involve the activation of the attachment system. This is achieved by an unwillingness to face interpersonal conflicts or issues, a refusal to attend to a significant other's desire for proximity/security and distress, and an avoidance of attachment-related thoughts and emotions (e.g., separation, rejection, abandonment, loss).

When required to cope with a threat, avoidantly attached individuals will use what is referred to as "distancing coping" (Lazarus & Folkman, 1984). Distancing coping involves both cognitive and behavioural strategies used to prevent threats and thoughts related to the threats from entering into consciousness. The outcome of distancing coping, if performed successfully, is the reduction of distress and the absence of any threat-related thoughts and feelings. One study investigated avoidantly attached individuals' experiences and methods of regulating negative affect (Mikulincer & Orbach, 1995). Anxiety levels, defensiveness (i.e., negative affect avoidance), and the degree to which participants used repression to defend against negative affect were all measured using self-report and memory recall tasks. In addition to recalling emotional memories, participants rated their arousal levels during the memory recall. Avoidantly attached individuals were found to employ repression to defend against negative affect. However, these strategies were not successful in lowering anxiety, as participants' anxiety levels were in the moderate to high range. Regarding the memory recall task, avoidantly attached individuals took the longest to retrieve emotional memories and reported the lowest level of emotional intensity related to these memories compared to the securely and anxiously attached participants. The authors suggested that although avoidantly attached individuals used repression to cope with negative memories, this coping style was not related to a decrease in anxiety.

Romantic relationships can also be negatively impacted by deactivation strategies. There are three main issues that can arise from the use of these strategies (Mikulincer & Shaver, 2003). First, as previously mentioned, deactivating strategies feature emotional, physical, and cognitive distance, which can result in a shallow relationship lacking in warmth. Second, relationship disagreements between romantic partners are potentially left unresolved due to avoidantly attached individuals' confrontation avoidance. Lastly, likely consequences of avoiding romantic partners' distress and desire for proximity and security are feelings of relationship dissatisfaction

in the relationship and subsequent relationship dissolution. For instance, in a longitudinal study that investigated avoidant attachment in romantic relationships, Simpson (1990) found that avoidantly attached individuals described their relationships as less interdependent and committed than did those high in attachment anxiety. This is consistent with the notion that avoidantly attached individuals are concerned with possibilities of becoming too intimate and too committed in romantic relationships (Mikulincer & Shaver, 2003).

1.4.2 Attachment Theory and Caregiving

Shaver and Hazan (1988) proposed that the provision of support, or caregiving towards romantic partners in need, would differ based on the attachment characteristics of those providing the support. They hypothesized that because securely attached individuals experienced care that was both consistent and responsive to their needs, these individuals would be able to easily offer care to their partner in times of need. In terms of insecure attachment, both anxious and avoidant attachment were proposed as having different patterns of inadequate caregiving due to histories of inconsistent (i.e., anxious attachment) or unresponsive (i.e., avoidant attachment) caregiving experiences with attachment figures. The caregiving style of highly anxiously attached individuals was hypothesized as being invasive, overinvolved, and unsuccessful, whereas for the caregiving style of highly avoidantly attached individuals was hypothesized as being unresponsive and unavailable.

Shaver and Hazan's (1988) hypotheses were examined by Kunce and Shaver (1994). Their findings supported the proposed hypotheses regarding attachment and caregiving patterns. Secure attachment was associated with sensitive and responsive caregiving, with such individuals more likely to report offering emotional support than insecurely attached individuals. These reports were also corroborated by their partners. Avoidantly attached individuals were found to strive for detachment from their partners during times of need, while the opposite was found for anxiously attached individuals. As predicted, anxious attachment was related to overinvolved caregiving that was both overwhelming and invasive. Several other studies using self-report measures have found similar relationships between attachment and caregiving abilities (Carnelley, Pietromonaco, & Jaffe, 1996; Feeney, 1996; Feeney & Hohaus, 2001).

Observational studies with romantic couples have also investigated the influence of attachment on caregiving during stressful situations. One of the first of these investigated whether attachment predicted spousal support in response to a laboratory stressor (Simpson,

Rholes, & Nelligan, 1992). Women were assigned the role of support seeker and men were assigned the role of caregiver. Support seekers were told they would experience an "anxiety-provoking activity" and were then reunited with their partners (i.e., the caregivers). Interactions between the couples were video recorded and coded for behaviours and verbal content indicative of the degree to which support was desired and provided. Support provided was predicted by the interaction between caregivers' attachment security and support sought by their partners. Caregivers high in attachment security provided higher levels of support when their partners desired more support and lower levels when they desired less support. Therefore, securely attached caregivers appeared to have a range of possible responses and were able to provide support based on an appraisal of their partners' desire for support. Support seekers received lower levels of support from avoidantly attached partners. Lastly, caregiver attachment anxiety was unrelated to support provided to support seekers.

Simpson and colleagues (Simpson, Rholes, Oriña, & Grich, 2002) conducted a study similar to the one above, but in this case, roles were assigned in the reverse manner (i.e., women were assigned the role of caregiver and men were assigned the role of support seeker). A similar pattern of relationships emerged in this study. At least two other observational studies using different procedures have found similar caregiving patterns associated with secure and avoidant attachment (Feeney & Collins, 2001; Fraley & Shaver, 1998). Thus, the idea that attachment is related to caregiving or support provision has received consistent support from both studies relying on self-reports of support (Carnelley et al., 1996; Feeney, 1996; Feeney & Hohaus, 2001) and studies using observational assessments of support (Feeney & Collins, 2001; Fraley & Shaver, 1998; Simpson et al., 1992; Simpson et al., 2002). There is no research that unequivocally explains this pattern of findings; however, it has been suggested that the ability to be empathic and manage one's own distress effectively is responsible for the ability of securely attached individuals to provide effective support (e.g., Mikulincer & Shaver, 2007).

Findings regarding the caregiving behaviours of anxiously attached individuals have been mixed. One study required participants to compose and deliver a videotaped speech (i.e., the anxiety-provoking activity) and complete a form indicating how nervous they were regarding the activity (Feeney & Collins, 2001). Caregivers read the form to discern how nervous and, therefore in need of support their partners were. Anxious attachment was associated with the provision of emotional support regardless of whether their partners indicated higher or lower

nervousness related to the speech activity. In terms of instrumental support (i.e., help and assistance provided by the caregivers to their partners before they participated in the anxiety-provoking activity), more instrumental support was delivered to partners more nervous than those less nervous. The authors suggested that the first set of findings supported the idea that anxiously attached caregivers lack flexibility and become overinvolved when offering support. Yet, because instrumental support was appropriately delivered based on their partners' level of support, they also speculated that anxiously attached individuals might not always be universally ineffective caregivers. However, another study found anxious attachment to be associated with poor caregiving (Collins & Feeney, 2000). In that study, one participant from each couple was required to divulge an anxiety-provoking problem to the other partner. Caregivers higher in attachment anxiety were found to offer less instrumental support, be less responsive, and display more negative caregiving behaviours to their partners in need.

1.4.3 Attachment Theory and Pain

Mikail and colleagues (Mikail, Henderson, & Tasca, 1994) proposed an interpersonal model of chronic pain based on their clinical experiences and the general attachment literature. This model is based on the idea that attachment characteristics influence how individuals respond to pain. Essentially, they stated that the developmental pathway from acute to chronic pain differs based on each attachment style (i.e., secure, dismissing, fearful, and preoccupied). These pathways are outlined below.

Given their history with attentive and nurturing attachment figures, securely attached individuals have a positive view of self and others, which makes them generally more willing to contact health care professionals after the development of pain. They are also able to describe their condition openly and nondefensively to health care professionals. In terms of social support, these individuals are likely to have extensive social supports that can be accessed when necessary. Taken together, securely attached individuals cope well with pain and are less likely to develop chronic pain. When chronic pain does occur, it more often results from circumstances outside the individuals' control, such as issues with the health care system (e.g., long-wait times, inappropriate pain treatment).

Conversely, individuals with dismissing attachment can be hesitant to engage with health care professionals when experiencing pain and when they do, they frequently present as self-sufficient, hostile, and frustrated. As a result of their past history with unresponsive caregivers,

they are said to have a positive view of self and negative view of others, which can result in an undervaluing of relationships and others. Dismissing individuals often ignore their pain symptoms. Consequently, they are generally in advanced stages of pain before help is sought. Moreover, they are likely to engage with multiple health care professionals, which leads to relatively shallow interactions. Health care professionals view these individuals as either coping well with minimal life disruption or as requiring services. Regardless, individuals with dismissing attachment are unlikely to comply with treatment strategies offered to them.

Individuals with preoccupied attachment fluctuate between seeking pain-related help and not. This ambivalence stems from a history of unreliable and disappointing caregivers. These individuals frequently present as intensely eager for help and as having a strong desire for their reports of pain to be understood and treated as credible (i.e., not exaggerated) by healthcare professionals. Given their history with inconsistent caregiving, these individuals are said to place great emphasis on their pain-related symptoms with the intention of receiving significant amounts of care. Initially, individuals with preoccupied attachment are perceived as having made significant gains in treatment. However, over time, their ambivalence, including their fear of failure and of disappointing others, often results in an absence of treatment progress. These individuals believe that they are being dismissed and that the treatment is not individualized enough for them, which causes them to visit several different health care professionals and to experience considerable life disruption.

Due to a history often characterized by abuse, fearfully attached individuals often distrust others to provide care and view themselves as unworthy of care. They often delay seeking help when confronted with a threatening or distressing situation, including painful experiences. Therefore, pain-related support is often sought after pain has been experienced for a considerable amount of time. There can be at least two outcomes that result from this delay. First, their pain has potentially progressed due to the absence of treatment. Second, when fearfully attached individuals are then seen by health care professionals, they often present as quite distressed, which can result in a psychiatric referral. Such a referral has the potential to delegitimize their pain experience and support their distrust of others and their self-perceptions of being unworthy of care. In the situation where treatment is obtained, these individuals often make minimal gains, as significant progress conflicts with their views of self as unworthy of care.

While many aspects of Mikail and colleagues (1994) hypotheses have not yet been fully

explored, their model did prompt numerous studies examining relationships between adult attachment characteristics and responses to pain. Two approaches have been commonly used to study attachment and pain. One approach utilizes generally healthy, non-clinical samples, whereas the other utilizes clinical samples. Findings from these two streams of research are briefly summarized below. More recently, research has begun to focus on the relationship between attachment characteristics and interpersonal variables related to the experience of pain. This research will be reviewed in a separate section.

1.4.3.1 Non-clinical samples. Studies with non-clinical samples aim to investigate the hypothesis that attachment insecurity is a risk factor for the development of chronic pain. The rationale for this approach is to demonstrate that: (a) attachment insecurity is related to responses to pain that are generally considered maladaptive and that could potentially play a role in the development of chronic pain; or (b) attachment security is related to pain responses that are adaptive and could possibly be linked to resiliency and protect against the distress associated with the experience of pain. There have been two approaches used to study the relationship between attachment and pain in non-clinical samples. The simplest approach has been to investigate relationships between self-reports of attachment and constructs that reflect maladaptive responses to pain. For example, the first of these found attachment anxiety to be positively associated with fear of pain, hypervigilance to pain, and pain catastrophizing (McWilliams & Asmundson, 2007). This finding suggests that the tendency of anxious individuals to hyperactivate in response to stress also extends to the experience of pain. In this study, attachment avoidance was only found to be positively associated with pain catastrophizing. A subsequent similar study focused on pain catastrophizing produced similar findings regarding attachment anxiety (McWilliams & Holmberg, 2010). However, the authors found when adjusting for attachment anxiety, neuroticism, and self-efficacy that attachment avoidance was instead negatively associated with pain catastrophizing. This more recent finding is consistent with the idea that avoidant individuals do not engage in hyperactivating responses to pain.

The second approach to studying attachment and pain in non-clinical samples is to investigate relationships between self-reports of attachment and responses to acute pain induced in a laboratory setting. Meredith (2013) conducted a review of eight studies that used this approach. The research indicated that insecure attachment was associated with more pain

catastrophizing (e.g., Andrews, Meredith, & Strong, 2011; Meredith, Strong, & Feeney, 2006b; Wilson & Ruben, 2011), more intense pain (Rowe et al., 2012), higher pain intensity ratings (MacDonald, 2008; Wilson & Ruben, 2011), and both a higher and lower pain tolerance (MacDonald, 2008; Rowe et al., 2012). Two studies in this review measured attachment using the Relationship Questionnaire (Bartholomew & Horowitz, 1991), which conceptualizes attachment as one of four distinct attachment styles. The first of these studies found that securely attached individuals reported feeling lower pain intensity and catastrophizing, and more in control of their pain (Meredith et al., 2006b). In the more recent study, secure attachment was associated with experiencing less depression and stress, but this attachment style was unrelated to any of the pain variables (Andrews et al., 2011). Regarding the insecure attachment variables, fearful attachment was related to less reported pain intensity and dismissing attachment was associated with less reported pain and increased CPT endurance. A more recent study found that in a sample of women undergoing a noxious laser stimulus, attachment avoidance was associated with more reported pain when participants were in the presence of their romantic partners compared to when alone (Krahé et al., 2015). The authors theorized that avoidantly attached individuals might be unable to utilize their usual coping strategies in the presence of their partners, which resulted in greater pain.

1.4.3.2 Clinical samples. The second major approach to researching attachment and pain has been to utilize samples of individuals with chronic pain. This research is aimed at investigating whether those higher in attachment insecurity experience poorer adjustment to chronic pain than those with greater attachment security. Research has shown that attachment insecurity is associated with several pain-related variables (e.g., Laird, Preacher, & Walker, 2015; Meredith et al., 2008; Porter et al., 2007). These studies have most often focused on the relationship between attachment and pain severity and intensity, disability, and depression.

Research on attachment and chronic pain has commonly addressed pain intensity. This research has used a variety of attachment measures and has generally found attachment insecurity to be unrelated to ratings of pain severity or intensity (e.g., Andersen, 2012; Ciechanowski et al., 2003; Davies, Macfarlane, McBeth, Morriss, & Dickens, 2009; Kowal et al., 2012; Meredith, Strong, & Feeney, 2006a; Meredith, Strong, & Feeney, 2007). However, a few studies have found attachment insecurity positively associated with pain intensity (Forsythe, Romano, Jensen, & Thorn, 2012; Kratz, Davis, & Zautra, 2012). Research on attachment and

chronic pain has often focused on attachment and pain-related disability. Several attachment measures have been used with varied findings. Some studies have found insecure attachment to be unrelated to pain-related disability (Andersen, 2012; Meredith et al., 2006a; Kowal et al., 2015), while other studies have found insecure attachment to be positively associated with disability (Davies et al., 2009; Forsythe et al., 2012).

Research using clinical samples has also investigated several appraisal variables (e.g., pain catastrophizing and pain self-efficacy) thought to play a role in adjustment to chronic pain. Of these appraisal variables, pain catastrophizing is the most relevant to the current document and will therefore be the only variable discussed. Insecure attachment has been positively associated with reports of pain catastrophizing using several attachment measures with mixed findings regarding the specific attachment dimensions associated with pain catastrophizing. Kratz et al. (2012) found both attachment anxiety and avoidance to be positively associated with pain catastrophizing in a community sample of women experiencing osteoarthritis and/or fibromyalgia pain. Similarly, Kowal et al. (2015) found both attachment avoidance and anxiety to be related to pain catastrophizing in a sample of patients undergoing multidisciplinary rehabilitation for chronic pain. One study (Meredith, Strong, & Feeney, 2005) found only the anxiety dimension of attachment to be related to pain catastrophizing and another (Ciechanowski et al., 2003) found ratings of fearful attachment to be associated with pain catastrophizing.

1.4.4 Attachment Theory and Interpersonal Variables

More recently, researchers have begun to investigate relationships between attachment characteristics and interpersonal variables, such as empathy (Hurter, Paloyelis, Williams, & Fotopoulou, 2014), self-perceived burden (Kowal et al., 2012), and social exclusion (Frías & Shaver, 2014). Of particular relevance to the current proposal, a couple of studies used the MPI to examine associations between attachment and various forms of responses to pain behaviour. In a sample of cancer patients, Gauthier et al. (2012) found that anxiously attached individuals perceived their significant others as responding to their pain behaviours with punishing responses. Similarly, Forsythe and colleagues (2012) examined both the effect of attachment style and the responses to pain by significant others in a sample of chronic pain patients. They found that secure attachment was negatively associated with perceived punishing responses and that fearful and preoccupied attachment was positively associated with perceived punishing responses. There were no significant associations between attachment style and perceived

solicitous support. A recent study with a clinical sample investigated perceptions of support received following surgery (Gur-Yaish, Zisberg, & Levin, 2014). Participants were required to report the extent to which their caregivers (i.e., spouse, child, or other) provided four types of support: instrumental support (e.g., help with daily activities), supervision of the instrumental support delivered by medical personnel, communication with the medical personnel (e.g., ensuring and explaining medical care), and psychological support (e.g., delivering emotional and distress-related support). Anxious attachment was associated with reports from pain patients of less supervision of the instrumental support provided by medical personnel, and less instrumental and psychological support from informal caregivers. Avoidant attachment was associated with both less communication with medical personnel and psychological support. Overall, these studies with clinical samples indicate that those with insecure attachment perceive their partners as less supportive than those with secure attachment. Given that these previously mentioned studies relied on self-report methodology, it is unclear whether the findings relating to individuals with insecure attachment perceiving their partners as providing less support than those with secure attachment reflect actual differences in support provision, differences in perceptions, or a combination of the two.

Research has explored the relationship between attachment and attitudes towards pain behaviours, deservingness of pain-related support, and desirability as a friend. The first of these found an association between attachment avoidance and the belief that displays of pain behaviour are objectionable and intolerable (McWilliams, Murphy, & Bailey, 2010). Another study showed that avoidant attachment was related to the view that individuals experiencing pain are less deserving of pain-related support and are less desirable as friends (Bailey, McWilliams, & Dick, 2012). No significant findings regarding attachment anxiety were found in either study. Nonetheless, the results of these studies raise the possibility that an individual's pain-related social support may be related to the attachment characteristics of their partners, with individuals with avoidant partners likely receiving lower levels of support.

Bailey, McWilliams, Holmberg, and Hobson (2015) examined attachment variables and interpersonal variables relevant to the experience of pain. They utilized a sample of non-clinical romantic couples to conduct a dyadic investigation of attachment and several variables related to social support. One member of each couple was assigned to the support seeker role and the other was assigned to the caregiver role. Both members of each pair rated the level of solicitous

support wanted by the individual in the support seeker role and the amount of solicitous support received by this individual. Associations between these variables and the attachment characteristics of both partners were investigated.

A large body of research exists relating insecure attachment to the different forms of affect regulation (i.e., hyperactivation and deactivation), so Bailey et al. (2015) hypothesized that anxious attachment would be positively associated with the desire for solicitous support, while avoidant attachment would be negatively associated with the desire for solicitous support. These hypotheses were supported. As well, the interaction between support seeker anxiety and avoidance was related to their reports of solicitous support wanted. Support seeker attachment anxiety was not significantly related to a desire for solicitous support amongst those low in attachment avoidance. However, amongst those high in attachment avoidance, support seeker attachment anxiety was positively associated with the desire to receive solicitous support. If these findings are conceptualized from an attachment style prototype perspective, these findings indicated that those with secure and preoccupied attachment (i.e., low avoidance) did not differ from each other in the desire for solicitous pain-related support when experiencing pain, whereas those with fearful attachment wanted more solicitous support than those with dismissing attachment. There were no significant associations between solicitous support wanted as reported by support seekers and their partners' attachment.

When Bailey et al. (2015) considered caregivers' perceptions of solicitous support wanted by support seekers, there was a significant positive effect of support seeker anxiety and a significant negative effect of support seeker avoidance. In light of the support preferences of support seekers noted earlier (i.e., the preceding paragraph) and these findings from the perspective of caregivers, it seems that caregivers recognized what their partners wanted (i.e., higher level of solicitous support wanted by anxiously attached support seekers and lower level of solicitous support wanted by avoidantly attached support seekers) or that what the support seekers wanted influenced caregivers' ratings. Caregivers' attachment characteristics were unrelated to their perceptions of what their partners wanted.

Bailey et al. (2015) found only one significant finding regarding the attachment characteristics of either partner predicting solicitous support provided as reported by support seekers. Support seeker anxiety was negatively associated with their perceptions of solicitous support received. There are at least two potential explanations for this finding. First, those higher

in attachment anxiety might actually receive less support. It is possible that the hyperactivating strategies used to obtain pain-related support aggravate their partners, leading to less solicitous support and more hostile responses. This notion is consistent with the findings of studies with clinical (Forsythe et al., 2012; Gauthier et al., 2012) and non-clinical samples (Feeney, Collins, Van Vleet, & Tomlinson, 2013; Feeney & Thrush, 2010). Second, attachment anxiety might influence perceptions of the support received. Consistent with this view, numerous studies have found a negative association between anxious attachment and perceptions of support received (Davila & Kashy, 2009; Ognibene & Collins, 1998). Importantly, there is also some evidence that these perceptions are not entirely due to differences in actual support provided (Collins & Feeney, 2004).

Bailey et al. (2015) found only one significant finding regarding the attachment characteristics of either partner predicting solicitous support provided as reported by caregivers. Caregiver avoidance was negatively associated with reports of solicitous support provided to the support seekers. This is consistent with other studies indicating that those with avoidant attachment prefer to provide less support (Feeney & Collins, 2001). However, as noted earlier, support seekers with avoidantly attached partners did not report receiving less solicitous support. This means that although caregivers higher in attachment avoidance report providing less solicitous support, their partners do not rate themselves as receiving relatively less solicitous support. The authors suggested several explanations for this discrepancy, which were primarily based on the likelihood that this sample had less experience with painful experiences requiring support. However, they also noted that previous research had found that avoidantly attached individuals were, at times, able to provide appropriate caregiving, which they suggested might explain this pattern of findings (Collins & Feeney, 2000).

1.5 Sex and Gender Differences

Sex and gender differences are well-established in the literature regarding most of the topics of central importance to the current program of research (viz., social support, pain catastrophizing, and attachment). Currently, some researchers recognize that gender and sex are not identical constructs, with sex referring to biological and physiological aspects present at birth and gender relating to the social and cultural characteristics attributed to females and males (Diamond, 2002). However, this distinction is seldom recognized within the research on adult pain and chronic pain, which has resulted in the terms sex and gender largely been used

interchangeably. In the current review, the term "sex" will be used, except in cases in which the researchers use a gender-related construct, such as levels of masculinity/femininity or gender roles. The following subsections briefly highlight the main findings regarding sex differences and these areas of study.

1.5.1 Sex Differences in Social Support

Studies investigating coping behaviours have frequently found females seek, utilize, and receive more social support when experiencing distress compared to males (e.g., Ashton & Fuehrer, 1993; Burda, Vaux, & Schill, 1984; Reevy & Maslach, 2001). A meta-analysis examining sex differences in coping came to the same conclusion (Tamres, Janicki, & Helgeson, 2002). The authors found that females were more likely than males to seek social support, especially when that support is emotional in nature. Only one study has investigated sex differences in social support preferences (Manne, Alfieri, Taylor, & Dougherty, 1999). They found that in a sample of individuals experiencing cancer, females reported higher support preference ratings for both instrumental and emotional support compared to men. There has also been limited research conducted relating to sex differences and pain-related support preferences. In a clinical sample using the PRPQ, McWilliams et al. (2012) found that females reported wanting significantly more pain-related solicitous support and activity direction (i.e., encouragement to engage in activities and distraction from pain). This is consistent with the idea that females generally want and seek out more social support than men.

One study conducted with chronic pain patients found that solicitousness of significant others was associated with pain-related variables (i.e., pain ratings, medication use, activity levels, disability, functional abilities, and pain tolerance) and these associations were moderated by the sex of the chronic pain patients (Fillingim, et al., 2003). Amongst males, spousal solicitousness was positively associated with higher levels of pain and self-reported disability (i.e., the degree that pain is believed to limit daily functional activities). Amongst females, spousal solicitousness was positively associated with other variables reflecting poor adjustment to chronic pain including lower pain tolerance, greater pain-related interference in life categories (viz., family, marital, work, and social/recreational areas of functioning), lower levels of activity, poorer functional abilities, and greater use of opioids. These findings show that sex differences affect how solicitous support relates to clinically important variables related to chronic pain.

1.5.2 Sex Differences in Pain, Disability, and Pain Catastrophizing

Studies have consistently demonstrated sex, gender, and sex role differences in pain experience (see for review Bartley & Fillingim, 2013; Fillingim, 2000), and pain-related variables, such as disability and pain catastrophizing. Sullivan and colleagues (2000) found that females reported more intense pain than males and had significantly longer pain behaviour episodes. Likewise, in two studies that examined sex differences in pain behaviour, females were shown to engage in more pain behaviours than males (Keefe et al., 2000; Romano et al., 2000). Studies examining sex differences in pain catastrophizing have found that females consistently obtain higher total PCS scores (Edwards, Haythornthwaite, Sullivan, & Fillingim, 2004; Sullivan et al., 1995). These sex differences in catastrophizing have been found in several different samples, including individuals experiencing musculoskeletal (Jensen, Nygren, Gamberale, Goldie, & Westerholm, 1994) and osteoarthritis (Keefe et al., 2000) pain, athletic and non-athletic undergraduate students (Sullivan, Tripp, Rodgers, & Stanish, 2000), and asymptomatic individuals participating in cold-pressor tasks (Forsythe, Thorn, Day, & Shelby, 2011).

1.5.3 Sex Differences in Attachment

Studies investigating sex differences in attachment have yielded mixed findings. Mickelson, Kessler, and Shaver, 1997) conducted the largest study of attachment using data from a large subsample (N = 8,080) of the National Comorbidity Survey (NCS). They found that females were more likely than males to be securely attached and that males were more likely than females to be avoidantly attached. No significant sex differences were found for anxious attachment. A meta-analysis of sex differences in attachment focused on romantic relationships has also been conducted (Del Giudice, 2011). The meta-analysis included 100 published and unpublished studies, with a total of 112 samples being analyzed. When the mean effect sizes were compared, the findings indicated that males scored higher in avoidance and lower in anxiety relative to females. As predicted there was significant heterogeneity between the samples (i.e., community, student, and online) with larger sex differences being associated with community samples and smaller differences associated with the student and online samples. The author hypothesized that the larger sex difference in the community sample was due to a less demographically restricted sampling population.

One study conducted with a sample of undergraduate university students (N = 179; 89 women, 90 men) explored differences in the dimensional and four-category conceptualizations of

attachment in relation to sex and sex role typologies (i.e., feminine, masculine, androgynous, and undifferentiated; Shaver et al., 1996). Participants completed a measure that classified them into one of the four sex typologies. Individuals classified as androgynous, which is defined as combination of femininity and masculinity, were more likely to be secure than individuals classified as any of the other typologies. The authors found negative associations between both femininity and avoidant attachment (i.e., high avoidance and low anxiety) and masculinity and anxious attachment (i.e., low avoidance and high anxiety). When they investigated sex differences, more men than women were categorized as having dismissing attachment (i.e., high avoidance and low anxiety) and more women than men as fearfully attached (i.e., high avoidance and high anxiety). Shaver and colleagues suggested that the sex and sex role typology differences found in attachment may result from a dissimilarity in the socialization of males and females and not arising from differences in biology.

In sum, the literature indicates that females are more likely to seek social support, report higher pain catastrophizing scores, and be securely attached compared to men. Therefore, it is important to consider sex when studying relationships between social support, attachment, and pain catastrophizing, as it has been shown to be related to these variables.

CHAPTER 2: THE PRESENT RESEARCH

2.1 Current Program of Research

The communal coping model of pain catastrophizing (CCM; Sullivan et al., 2001) posits that pain catastrophizing is related to a variety of social processes, such as engaging in pain behaviour as an interpersonal pain management strategy in order to attain a variety of social gains. Arguably, the CCM is the most well-researched and prominent framework for investigating pain-related interpersonal variables. Attachment theory has led to a far greater amount of research regarding interpersonal processes, in general, but has only recently been applied to understanding pain-related individual differences and pain-related social processes.

2.2 Purpose of Current Program of Research

The aim of the proposed program of research was to compare the relationship strength between variables relevant to attachment theory and the CCM and several key interpersonal pain-related variables (i.e., preferences for solicitous support and perceptions of support received) that may play a role in both the development and maintenance of chronic pain in both non-clinical and clinical samples. Both attachment theory and the CCM have been used to investigate a variety of pain-related processes. However, this program of research uniquely contributes to the literature by comparing these frameworks in the strengths of their relationships with interpersonal pain-related variables amongst those experiencing and not experiencing pain. This research was based on the idea that adult attachment dimensions are more fundamental individual difference variables than pain catastrophizing and that attachment insecurity underlies both reports of pain catastrophizing and pain-related social variables.

The original conceptualization of pain catastrophizing was based on a cognitive theory framework, which proposed that exaggerated cognitive pain appraisals result in negative emotions, including fear, anxiety, and depression that influence the experience of pain and can result in poor adjustment to pain and disability (Lazarus & Folkman, 1984; Sullivan et al., 1995). A more recent cognitive-behavioural model has been used to explain pain-related disability with pain catastrophizing as a mechanism in the development of disability (Vlaeyen & Linton, 2000). This model proposes that catastrophic thinking contributes to the fear of movement and hypervigilance about pain, which leads to the avoidance of any activity potentially related to pain (Vlaeyen & Linton, 2000). This fear-avoidance model and the CCM are similar as they both posit that catastrophic or distressed cognitions and emotions lead to behaviour that reflects this

distress. However, it is also plausible that a different underlying variable, such as attachment insecurity, could underlie both the distressed cognitive and emotional responses to pain, referred to as pain catastrophizing, and behavioural responses to pain (i.e., pain behaviour). Cognitive-behavioural approaches are based on the idea that cognitive processes (e.g., appraisals) are linked with life experiences, including early childhood experiences, and that these cognitive processes influence how individuals respond to life events. Therefore, the way by which individuals with chronic pain appraise their abilities to contend with their pain can either facilitate or hamper the process of adaptation (Beck & Haigh, 2014; González-Prendes & Resko, 2012; Knapp & Beck, 2008).

There are at least two reasons to suggest attachment anxiety may underlie the cognitive and emotional responses associated with pain catastrophizing. First, several studies have found moderately strong positive associations between attachment anxiety and pain catastrophizing (McWilliams & Holmberg, 2010; Meredith et al., 2006b; Wilson & Ruben, 2011). Second, descriptions of hyperactivation of the attachment system thought to be characteristic of those high in attachment anxiety are very similar to descriptions of the pain-related behaviour and interpersonal aims of those high in pain catastrophizing (McWilliams & Holmberg, 2010; Meredith et al., 2005). Most notably, they both involve a desire for proximity with caregivers and an exaggerated display of distress aimed at eliciting support. While several studies have found a relationship between attachment anxiety and pain catastrophizing, research has yet to investigate them together in relation to pain-related variables relevant to both attachment theory and the CCM.

CHAPTER 3: STUDY 1

3.1 Purpose of Study 1

Study 1 examined both attachment and pain catastrophizing variables in relation to solicitous pain-related support preferences in a non-clinical sample of romantic couples. This study is the first to include variables related to both attachment theory and the CCM with the aim of determining which set of variables is most strongly related to pain-related interpersonal variables. A non-clinical sample of romantic couples was recruited so it would be possible to compare the pattern of findings amongst those not experiencing pain to those experiencing chronic pain (Study 2). When sampling from both members of a couple, research in this area has pseudo-randomly assigned (i.e., based on upcoming birthday) one member of the couple as the support seeker and the other as the caregiver (Bailey et al., 2015). The support seekers reported on their experiences in terms of wanting and receiving pain-related support, while the caregivers reported on their appraisals of what their partners want and what they provide to them. Solicitous support is the form of support that has been the most consistently associated with disability and is also the most directly relevant to the predictions of attachment theory and the CCM, so variables related to this type of support were the focus of this program of research.

When presenting the hypothesis and results, abbreviations are used to refer to the four different solicitous support variables. Solicitous support wanted is abbreviated as SSW. In addition, "ss" added to this abbreviation denotes that the reports are from the support seekers, and "cg" added to it denotes that the reports are caregivers' perceptions of what the support seekers want. Solicitous support provided is abbreviated as SSP. Similarly, "ss" is added to this abbreviation to denote support seekers' perceptions of support they have been provided with or received, and "cg" is added to denote caregivers' reports of the support they have provided.

Abbreviations for research questions and hypotheses were also created to enhance the readability of this document. In all cases in which theory or past research clearly suggests a relationship between variables, a specific hypothesis was made and labelled with a number (e.g., H1). Hypotheses were made regarding both the reports of support seekers and caregivers. Letters were used to distinguish between the two related hypotheses (i.e., "a" for those investigating support seekers' reports, and "b" for those investigating caregivers' reports). Open research questions were labeled numerically (e.g., R1) when considering relationships for which there are no hypotheses. All hypotheses and research questions are reviewed below. As well, they are

listed in Table 3.1. Interaction effects involving the two attachment dimensions of the support seekers and the two attachment dimensions of the caregivers were also included in the analyses. Given the paucity of research regarding attachment interaction effects and the dependent variables, no hypotheses were made for these analyses. Several single-item ratings were also posed to both the support seekers and caregivers to further explore their experiences relating to how support preferences are communicated and received, and how caregivers determine what support to provide to their partners.

3.2 Study 1 Hypotheses

3.2.1 Solicitous Support Wanted

Pain-related support preferences have been shown to differ based on attachment (Bailey et al., 2015). Secondary attachment strategies (i.e., hyperactivation and deactivation) associated with attachment have been proposed as the underlying mechanism by which these differences emerge (Bailey et al., 2015). Hyperactivation involves intrusive attempts at gaining proximity and support from attachment figures during distressing events, whereas deactivation is the opposite with avoidantly attached individuals attempting to cope with the distressing event themselves by shunning interpersonal support (Mikulincer & Shaver, 2007). Given this model of secondary attachment strategies and Bailey et al.'s (2015) research on attachment and pain-related support incorporating both support seeker and caregiver perceptions, it was hypothesized that support seeker anxiety would be positively associated with SSWss (i.e., their reports of solicitous support wanted; H1a) and SSWcg (i.e., caregiver reports of solicitous support wanted; H1b). Based on the same literature, it was also hypothesized that support seeker avoidance would be negatively associated with SSWss (H2a) and SSWcg (H2b).

Pain catastrophizing has been linked to differences in pain-related support preferences and potentially solicitous support eliciting pain behaviours. Sullivan et al. (2004) found that high catastrophizers participating in a pain-inducing procedure displayed more pain behaviours in the observer-present condition compared to the observer-absent condition. The authors speculated that the high displays of pain behaviour might be a result of solicitous spouses and the desire for solicitous support. Another study found a positive association between pain catastrophizing and the desire for solicitous support (McWilliams et al., 2014). Therefore, it was expected that support seeker pain catastrophizing would be positively associated with SSWss (H3a) and SSWcg (H3b).

Caregiver attachment (Wilson & Ruben, 2011) and pain catastrophizing (Gauthier, Thibault, & Sullivan, 2011) have also been considered in the literature as potentially influencing support seekers' preferences for pain-related support. Bailey et al. (2015) examined whether caregiver attachment was related to support seeker and caregiver reports of solicitous support wanted. Based on their statistically non-significant findings, no hypotheses were proposed regarding associations between caregivers' attachment anxiety and SSWss (R1a) or SSWcg (R1b). Similarly, no hypotheses were made regarding caregivers' attachment avoidance and SSWss (R2a) or SSWcg (R2b).

Research has been limited regarding caregiver pain catastrophizing and pain-relevant interpersonal variables. Gauthier et al. (2011) found that individuals experiencing pain who were high in pain catastrophizing displayed more pain behaviours with low catastrophizing partners (Gauthier et al., 2011). Gauthier and colleagues suggested that the caregivers low in catastrophizing might underrate the severity of their partners' pain, which might cause their high catastrophizing partners to increase their pain behaviours in an attempt to communicate their pain experience to their partners. This study suggests that the pain catastrophizing of both partners' is relevant to the study of interpersonal factors and/or processes associated to the experience of pain. However, in the absence of any previous research investigating the role of caregivers' pain catastrophizing in the support wanted by their partners, there were no hypotheses regarding caregiver pain catastrophizing and SSWss (R3a) or SSWcg (R3b).

3.2.2 Solicitous Support Provided

A similar approach was used to investigate solicitous support provided as reported by support seekers and caregivers. Studies that have examined the relationship between support seeker attachment and perceptions of solicitous support provided have shown mixed results. One study of cancer patients found no association between support seekers' attachment anxiety and their perceptions of solicitous support provided to them (Gauthier et al., 2012). However, attachment avoidance was found to be negatively related to support seekers' perceptions of solicitous support provided to them. Another study using a non-clinical sample showed a negative relationship between support seeker attachment anxiety and their perceptions of solicitous support provided to them (Bailey et al., 2015). No relationship was found for attachment avoidance. Given that the literature has been inconclusive and the Bailey et al. (2015) study was the most similar to the proposed research, the hypotheses were based on their findings.

Therefore, it was expected that support seeker attachment anxiety would be negatively associated with SSPss (H4a), while no hypothesis was made for SSPcg (R4b). No hypotheses were proposed regarding associations between support seeker avoidance and SSPss (R5a) or SSPcg (R5b).

Support seekers' pain catastrophizing has been linked to reports of support provided to them. Boothby et al. (2004) did not find a relationship between chronic pain patients' reports of pain catastrophizing and their perceptions of solicitous support received. Instead, pain catastrophizing was positively related to pain patients' perceptions of receiving punishing responses from their spouses. Another study found pain catastrophizing to be associated with reports of receiving both solicitous and punishing responses from partners (Buenaver et al., 2007). Keefe et al. (2003) investigated the relationship between pain patients' catastrophizing and their perceptions of support received and also their partners' ratings of support provided. Pain patient reports showed a positive association between pain catastrophizing and instrumental support (i.e., tangible assistance), but not with subjective social support (i.e., emotional support). The study also found a positive relationship between patients' levels of pain catastrophizing and spouses' reports of responding critically to their partners' pain. Therefore, it is expected that support seekers' pain catastrophizing will be negatively associated with SSPss (H5a) and SSPcg (H5b).

Caregiver attachment characteristics appear to be related to the provision of solicitous support in romantic relationships. Previous research with a sample of married couples has indicated that those with insecure attachment withhold support based on several factors (e.g., lacking the knowledge to properly support, too stressful, partner is unreceptive; Feeney et al., 2013). Based on those research findings, coupled with an absence of conclusive evidence regarding the caregiving abilities of individuals with anxious or avoidant attachment in both dating (Carnelley et al., 1996; Collins & Feeney, 2000; Simpson et al., 1992; Simpson et al., 2002) and married couples (Feeney, 1996; Feeney & Hohaus, 2001), no hypotheses were proposed regarding associations between caregiver attachment anxiety and either SSPss (R6a) and SSPcg (R6b). Bailey et al. (2015) found caregiver avoidance to be negatively associated with caregivers' reports of support provided. Moreover, studies have shown that attachment avoidance is associated with the belief that individuals experiencing pain are less deserving of support (Bailey et al., 2012) and that displays of pain behaviours are objectionable (McWilliams

et al., 2010). Thus, it was expected that caregiver avoidance would be negatively associated with SSPss (H6a) and SSPcg (H6b).

Research suggests that the pain catastrophizing of both romantic partners may play a role in the communication and expression of the pain experience. More specifically, Gauthier and colleagues (2011) raised the possibility that those low in pain catastrophizing tend to be relatively unresponsive to the pain of others. Based on this possibility, it was hypothesized that caregiver pain catastrophizing would be positively associated with SSPss (H7a) and SSPcg (H7b).

3.2.3 General Hypotheses

The overall aim of this study was to compare the strength of relationships between variables from the two interpersonal-frameworks (i.e., attachment theory and the CCM) and the support seeker and caregiver variables related to solicitous support. It was hypothesized that the attachment variables would be more strongly related to these variables than the pain catastrophizing variables.

To investigate whether these variables (viz., attachment and pain catastrophizing variables) were related to pain support preferences amongst those not experiencing chronic pain, the first study was conducted with a non-clinical convenience sample of romantic couples. To investigate whether similar patterns of association remain once chronic pain develops, the second study was conducted with a sample of individuals with chronic pain in romantic relationships.

3.3 Study 1 Methods

3.3.1 Study 1 Participants

One member of each couple was assigned to the support seeker role and the other relationship partner was assigned to the caregiver role. Participants were assigned to these roles using pseudo-random assignment based on their birthdays. More specially, participants who indicated that their birthday was coming up next were assigned to the caregiver role and those who indicated that their partner's birthday was next was assigned to the support seeker role. A total of 184 couples completed the survey (i.e., both partners completed the relevant questionnaires). Of these 184 couples, six couples identified their relationship as being in a relationship "with a partner of the same sex". To ensure the sample was as homogenous as possible, same-sex couples were not included in the analyses. Criteria based on the Pain History Scale (McWilliams & Asmundson, 2007) were used to determine whether support seekers and

caregivers were currently experiencing chronic or persistent pain. Nine support seekers were categorized as currently experiencing chronic or persistent pain and were excluded from the analyses. In both cases, the samples (i.e., support seekers experiencing chronic pain and same-sex couples) were not large enough to conduct separate subsample analyses. Finally, five couples were removed due to either the support seeker or caregiver missing over 5% of their responses. A final sample of 164 heterosexual romantic couples was included in the analyses.

Demographics are reported separately for support seekers and caregivers. In some cases, support seeker and caregiver information are presented in the same parentheses to avoid unnecessary repetition of category labels. When this occurs, support seeker information is presented first, followed by caregiver information. A slight majority of the support seekers were female (53%) and correspondingly a slight majority of the caregivers were male (53%). Ages ranged from 18 to 68 years for support seekers (M = 27.85, SD = 9.73) and from 18 to 63 years for caregivers (M = 27.66, SD = 8.74). Both groups were primarily White (support seekers and caregivers 82%), followed by Asian, (6%, 6%), and Aboriginal (4%, 1%). Geographical location was highly similar across both groups with the majority (96%, 95%) residing in Canada. The marital or relationship status of the couples were as follows: Married or engaged (32%, 31%), talked about marriage without formal plans (41.5%, 37%), thought about marriage without discussing with partner (5.5%, 12%), seriously dating exclusive (21%, 19%), and casually dating non-exclusive (0%, 1%). The majority of both the support seekers and caregivers were either employed (including stay-at-home parents; 50%, 57%) or students (46%, 38%). Most had attained a high school diploma or above (98%, 99%).

3.3.2 Study 1 Procedure

Study 1 received ethical approval from the Research Ethics Board at the University of Saskatchewan. The first study utilized methodology similar to that used by Bailey et al. (2015), with both members of a couple being recruited. Participants were recruited from the general population using flyers and advertisements distributed at a variety of public spaces (e.g., coffee shops, libraries, event boards) and through online websites across Canada (e.g., Kijiji, Craigslist, Reddit, research study websites). Participants were also recruited through the University of Saskatchewan's website (i.e., PAWS) and through other university sources across Canada (i.e., recruitment emails distributed to psychology and psychology-related departments). The study was broadly described as being focused on relationships and health. The more detailed materials

(e.g., consent form) specifically indicated that examining support behaviours related to the experience of pain was an aim of the study. FluidSurveys, an online survey tool, was used to collect participant data for this study. FluidSurveys allows for surveys to be made completely anonymous and secure. As well, it is operated by a Canadian company that adheres to Canadian privacy and accessibility standards (W3C).

To be eligible to participate, individuals were required to be aged 18 years or older and in a romantic or dating relationship of at least six months. There were no other exclusion criteria relating to the specifics of the dating or romantic relationship (e.g., exclusivity). Participants were compensated for their time with an entry into a prize draw for one of eight $100 VISA gift cards. Participants provided demographic information, reported on recent experiences with pain, and completed self-report measures focused on attachment characteristics, pain catastrophizing, and pain-support preferences and perceptions of support. Pain-related support preferences and perceptions of support as reported by both the support seekers and caregivers are the main dependent variables of the study. Support seekers reported on the amount of solicitous support they wanted and their perceptions of support provided to them, while caregivers were asked to report on their perceptions of solicitous support wanted by their partners and solicitous support provided. Participants also responded to several one-item rating scales focused on their experiences with pain-related support in the context of their romantic relationships. These questions are not the focus of the study. However, they were used as another avenue to further investigate the relationship between pain-related support and both attachment and pain catastrophizing variables.

3.3.3 Study 1 Measures

3.3.3.1 Demographic information. Participants completed a questionnaire consisting of items asking for basic demographic information. Information collected includes age, support seeker and caregiver sex, highest level of education, geographic location, marital status, length of current relationship, sexual orientation, primary area of employment and occupation, and ethnic background.

3.3.3.2 Pain History Scale. The Pain History Scale is a self-report measure created by McWilliams and Asmundson (2007) to determine whether an individual experiences chronic pain. This measure was based on items used in surveys of the general population. Four criteria are employed to determine whether participants have chronic or persistent pain. These are (a) the

presence of continuous or intermittent pain over the past 3 months, (b) the pain occurring almost every day or more, (c) the intensity of the pain rated as discomforting or worse, and (d) having consulted with a physician regarding the pain. Those endorsing all of these criteria are considered to have chronic pain. This measure was used to determine the percentage of the sample that was experiencing chronic pain.

3.3.3.3 Recent experiences with pain. To characterize the sample in terms of their experiences with pain, several questions were asked regarding recent experiences with pain. Participants were asked to indicate (i.e., yes or no) whether they had experienced several types of pain (e.g., headache/migraine, back pain, muscle pain, dental pain, menstrual pain, neck pain) in the past four weeks. They were also provided with an open-ended prompt to include any pain type that they had experienced in the past 4 weeks that was not listed. To gain a better understanding of participants' pain experiences, a list of experiences that generally result in pain (e.g., broken bone, sprain, bike accident, being hit by a motorized vehicle, surgery) were provided and participants were asked to indicate (i.e., yes or no) whether they had experienced that event and whether it had caused them pain. Lastly, participants were asked whether they had experienced pain in the last year and whether that pain experience had already been included in the questionnaire. Those who indicated that they had experienced pain in the last year, but it was not reported in the questionnaire were asked some follow-up questions (i.e., "*How long ago did you experience this pain?*" "*What type of pain did you experience?*" "*How long did this pain last?*"). Participants who responded that they did not experience pain in the last year were asked a separate set of follow-up questions (i.e., "*When was the last time you experienced any type of pain?*" "*What type of pain did you experience?*" "*How long did this pain last?*")

3.3.3.4 The RAND 36-item short-form health survey (SF-36). The SF-36 (Hays, Sherbourne, & Mazel, 1993) is a widely used self-report quality of life measure, which focuses on eight areas of health. These areas include: physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, general mental health, social functioning, energy/fatigue, and general health perceptions. In terms of the present study, the two items (sample item, "*How much bodily pain have you had during the past 4 weeks?*") associated with the Bodily Pain subscale were used to confirm that most support seekers had experienced pain recently. Studies have found Cronbach's alphas for this subscale to range from .78 (RAND Health, n.d.) and .90 (Ware & Gandek, 1998). There is evidence for the

validity of this measure (e.g., Ware & Sherbourne, 1992), including criterion (Jenkinson, Wright, & Coulter, 1994) and construct validity (Jenkinson, Stewart-Brown, Peterson, & Paice, 1999; Jenkinson, Coulter, & Wright, 1993). This measure was scored using the most common method, which is transforming each item into a score ranging from 0 to 100 (Hays & Morales, 2001; RAND Health, n.d.).

3.3.3.5 Follow-up pain-related support questions. **S**upport seekers and caregivers were each asked to respond to three single-item rating scales. Support seekers were asked about their satisfaction with their pain-related support (i.e., "*How satisfied are you with the support you receive from your partner during episodes of pain?*"), the ability of their partners to recognize when the support seekers are experiencing pain (i.e., "*How skilled does your partner seem to be at knowing when you are experiencing pain?*"), and their willingness to ask for help when in pain (i.e., "*How comfortable are you asking for help from your partner when you are in pain?*"). The caregivers were asked about how satisfied they think their partners are with the provision of pain-related support (i.e., "*How satisfied do you think your partner is with the support he or she receives when experiencing an episode of pain?*"), their ability to recognize when their partners are experiencing pain (i.e., "*How difficult or easy is it to know when your partner is experiencing pain?*"), and how comfortable they perceive their partners to be asking for help when in pain (i.e., "*How comfortable does your partner seem to be directly asking for help when he or she is in pain?*").

All the single-item ratings utilized a 6-point Likert scale. The response options vary depending on the wording of the question. For the support seeker and caregiver reports of satisfaction with support the responses ranged from 1 (*Very unsatisfied*) to 6 (*Very satisfied*). Responses related to support seekers' reports of how skilled their partners are in knowing when they are in pain ranged from 1 (*Very unskilled*) to 6 (*Very skilled*) and caregivers' reports of how difficult or easy they find knowing when their partners are experiencing pain ranged from 1 (*Very difficult*) to 6 (*Very easy*). Response options for both support seekers and caregivers' reports of support seekers' comfort in asking for pain-related support ranged from 1 (*Very uncomfortable*) to 6 (*Very comfortable*).

3.3.3.6 The experiences in close relationships questionnaire – revised (ECR-R). The ECR-R (Fraley, Waller, & Brennan, 2000) includes both an 18-item attachment anxiety scale that measures worries or concerns regarding rejection or abandonment by a romantic

partner (sample item, *"I often worry that my partner doesn't really love me"*) and an 18-item avoidance scale that measures discomfort with getting close to romantic partners (sample item, *"I prefer not to be too close to romantic partners"*). Each item is rated on a 7-point Likert scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Scores are calculated by averaging across all relevant items, after reverse-scoring where necessary, so that higher values indicate a higher level of either attachment anxiety or avoidance. This revised version of the widely-used Experiences in Close Relationships Inventory (Brennan, Clark, & Shaver, 1998) shares many items with the original measure, but has slightly stronger psychometric properties (Fraley et al., 2000). Both ECR-R scales have Cronbach's alphas and 3-week test–retest reliabilities beyond .90. Furthermore, there is strong evidence of their convergent and discriminant validity (Sibley, Fischer, & Liu, 2005).

3.3.3.7 Pain Catastrophizing Scale (PCS). The PCS (Sullivan et al., 1995) is a 13-item self-report measure designed to assess pain catastrophizing using questions relating to thoughts and feelings experienced during pain. Each item is rated on a 5-point Likert scale ranging from 0 (*Not at all*) to 4 (*All the time*). The measure was minimally modified from the standard paper-and-pencil format for use online. Rather than have participants refer to a response scale and input the numbers into a box next to each question, participants were asked to click on a circle that corresponded to the response choices that were listed above. Therefore, the instruction to "*Use the following scale*" was removed because it was irrelevant. Scores can be used to obtain either a total score or subscale specific scores (i.e., rumination, magnification, and helplessness). A total PCS score was used in the current study and was created by summing responses to the 13 items. Total scores could range from 0 to 52. Total scores of 30 or above are considered clinically relevant levels of catastrophizing (Sullivan, 1995). Only the total PCS score was used in the current program of research. There were two main reasons for this approach. First, pain catastrophizing, not the three subcomponents, was the most relevant to the research questions based on previous research studies. Moreover, a review of the literature revealed that most studies use PCS scores rather than its subscales. Second, the three subscales were found to be highly correlated (i.e., ranging from r = .62 to .80), which could present issues with multicollinearity in the regression analyses. The PCS has good levels of scale score reliability overall (α = .87) and acceptable test-retest reliability scores at 6-week (r = .75) and 10-week periods (r = .70; Sullivan et al., 1995). Research has shown the PCS to have good psychometric

properties for use with non-clinical and clinical samples (Sullivan et al., 1995; Van Damme, Crombez, Bijttebier, Goubert, & Van Houdenhove, 2002) with one study (Osman et al., 2000) finding similar levels of scale score reliability for a community (α = .95) and outpatient pain sample (α = .92). Validation studies found support for its construct validity. For example, higher PCS scores were associated with more catastrophizing thoughts assessed using an interview focused on cognitions during an experience of pain (Sullivan et al., 1995). In addition, there is evidence supporting the discriminant, convergent, and concurrent validity of the PCS (Osman et al., 1997).

3.3.3.8 Relationship Assessment Scale (RAS). The RAS (Hendrick, 1988) is a 7-item self-report measure designed to assess global relationship satisfaction (sample item, *"How well does your partner meet your needs"*). Each item is rated on a 5-point Likert scale ranging from 1 (*Low satisfaction*) to 5 (*High satisfaction*). The RAS has good levels of scale score reliability overall (α = .91; Vaugh & Matyastik Baier, 1999), and a good test-retest reliability score (r = .85; Hendrick, Dicke, & Hendrick, 1998). There is also support for its criterion-related and convergent validity (Vaugh & Matyastik Baier, 1999). This measure was used to characterize the sample in terms of its level of relationship satisfaction.

3.3.3.9 Pain response Questionnaire – Support Seeker Version (PRQ-SS). The PRQ-SS is a 39-item self-report measure designed to assess what those in a support seeker role want in terms of pain-related social support and their perceptions of the support they receive. It is an adaptation of the Pain Response Preference Questionnaire (PRPQ; McWilliams et al., 2009). The original measure assessed preferences for how others respond to one's pain behaviour, and included scales based on factor analyses of its items. The PRQ-SS presents items from the PRPQ that describe three forms of support (i.e., solicitous, encouragement, and suppression). Respondents first indicated the degree to which they wanted that form of support (i.e., "*I want my partner to do this*"), and then indicated the degree to which they perceived this type of response was provided to them (i.e., "*My partner actually does this*"). A 4-point Likert scale ranging from 1 (*Strongly disagree*) to 4 (*Strongly agree*) is used. The full measure was administered, but only the 10-item solicitous support scale was used in the analyses in the study (sample item, "*Help me with whatever I am doing*"). The solicitous support wanted and solicitous support provided scales were scored separately by averaging all 10 items associated with each of the two scales. Similar to the abbreviations used to present the hypotheses, these

two scales are referred to as SSWss and SSPss.

The PRPQ's solicitous support scale was found to have good psychometric properties with high levels of scale score reliability ranging from .86 to .88 in two non-clinical samples (McWilliams et al., 2009) and two clinical samples (McWilliams et al., 2012; McWilliams et al., 2014). In addition, there is support for the convergent and discriminant validity of the solicitous support scale (McWilliams et al., 2009).

3.3.3.10 Pain Response Questionnaire – Caregiver Version (PRQ-CG). Caregivers completed a questionnaire similar to the one their partners (i.e., the support seekers) completed (i.e., PRQ-SS). This measure requests that caregivers identify their partners' preferences for pain-related support and report on what support they provide to their partners. The difference between the two versions is in the wording that precedes the test items. The PRQ-SS instructs support seekers to first respond to an item based on their preference for the type of support included in the item (sample item, *"Ask if I need help"*) and then to indicate the extent to which their partners respond to them in that manner. In contrast, the PRQ-CG instructs caregivers to first indicate the degree to which they believe their partners want the type of support described in each of the items (i.e., "*My partner wants me to do this*") and to then indicate the degree to which they provide this type of response (i.e., "*I actually do this*"; sample item, *"Ask if I need help"*). Again, a 4-point Likert scale ranging from 1 (*Strongly disagree*) to 4 (*Strongly agree*) is used. Similar to the PRQ-SS, these two scales are referred to as SSWcg and SSPcg. Scores were calculated separately for both scales (i.e., caregivers' reports of solicitous support wanted and provided) were obtained by calculating the average of all ten items associated with each of the two scales.

3.3.4 Study 1 Analyses

Several preliminary analyses were conducted to evaluate the data and determine whether the variables met the assumptions of the primary statistical analyses. In addition, correlation analyses were conducted to examine univariate associations between specific demographic variables (i.e., age, support seeker sex, and relationship length), the attachment theory and CCM variables, and the solicitous support variables. The primary analyses were two sets of four multiple regression analyses predicting scores on the PRQ-SS (SSWss and SSPss) and on the PRQ-CG (SSWcg and SSPcg). The first set of analyses used the ECR-R anxiety and avoidance scales scores (i.e., attachment theory variables) as predictor variables. The second set of analyses

focused on the total PCS scale scores (i.e., CCM variables) as predictors.

All eight hierarchical regression models included support seeker sex and relationship length as covariates in Step 1. For the main independent variables that were the focus of the study (i.e., attachment and catastrophizing), the relevant variables from both relationship partners (i.e., support seekers and caregivers) were included in order to account for the potential interdependence between the relationship partners. In the analyses that used the attachment variables, support seeker anxiety and avoidance and caregiver anxiety and avoidance were entered in Step 2. The interaction between support seeker anxiety and avoidance and the interaction between caregiver anxiety and avoidance were both entered in Step 3. Interaction effects were investigated using Preacher and colleagues (Preacher, Curran, & Bauer, 2006) statistical procedures and online software (http://www.quantpsy.org/interact/). Similar to Bailey et al. (2015) interaction effects were probed using the prototype perspective whereby the combination of high and low attachment anxiety and avoidance was used to define four types of attachment styles (Bartholomew & Horowitz, 1991; Mikulincer & Shaver, 2003). These four attachment styles are preoccupied attachment (viz., high anxiety and low avoidance), dismissing attachment (viz., low anxiety and high avoidance), fearful attachment (viz., high anxiety and avoidance), and secure attachment (viz., low anxiety and low avoidance). In the analyses that used the CCM variables, support seeker and caregiver total PCS scores were entered in Step 2. There were no pain catastrophizing interaction terms, so analyses involving support seeker and pain catastrophizing variables did not include a Step 3.

There is no commonly employed statistical method used to compare two sets of variables in their ability to determine which set is more strongly related to a dependent variable. However, there is a current trend of attending to indices of the magnitudes of association (i.e., effect sizes) in statistical analyses (e.g., Sullivan & Feinn, 2012). Given this recent focus, the current program of research examined the pattern of findings (i.e., the number of significant associations, the magnitudes of the associations, and the change in R^2-values for each model) to compared which model (i.e., attachment theory or the CCM) and associated variables (i.e., attachment anxiety and avoidance, and pain catastrophizing) were more strongly related to the dependent variables (i.e., solicitous support wanted and provided as reported by support seekers and caregivers). Two criteria were used to determine which model better predicted support seekers' pain-related support preferences. First, if one model produced statistically significant findings and the other

did not, the former was considered a stronger approach for that dependent variable. Second, if both models produced statistically significant findings, effect sizes were compared. R^2-change statistics were used for this purpose. If the difference between effect sizes exceeded a value reflecting a moderate effect size (i.e., a difference in R^2 value of .09 or greater), the model with the larger effect size was considered superior. The criterion for a moderate effect size was based on a transformation of Cohen's (1992) criteria for correlation effect sizes (i.e. small $r \geq .10$; medium $r \geq .30$; large $r \geq .50$) into effect sizes suitable for multiple regression (i.e., small $R^2 \geq .01$; medium $R^2 \geq .09$; large $R^2 \geq .25$). If the effect size for the attachment theory and CCM variables did not exceed a moderate effect size difference and both models were statistically significant, then both approaches were considered equally strong in predicting the dependent variable. Although not identical to the current approach, a similar method was used by McWilliams, Kowal, and Wilson (2015) when evaluating several short-form versions of two self-report measures.

3.4 Study 1 Results

3.4.1 Study 1 Data Screening

Prior to undertaking the primary analyses, support seeker and caregiver sex, relationship length, the PRQ-SS (support seeker) scales (SSWss and SSPss), PRQ-CG (caregiver) scales (SSWcg and SSPcg), ECR-R attachment anxiety and avoidance variables, and the PCS total score were examined through several SPSS programs for missing values, univariate and multivariate outliers, and regression assumptions.

3.4.1.1 Missing value analysis. A Missing Value Analysis was conducted and five couples (either support seeker or caregiver) were identified as having over 5% missing data. After these five couples were removed, the percentage of missing data ranged from 0 to 2.4%. Item-wise missing data ranged from 0 to 1.8% missing per item with only three items missing 1.8% of responses. Missing data were imputed using the expectation-maximization approach using SPSS v24 (Dong & Peng, 2013; Tabachnick & Fidell, 2013).

3.4.1.2 Outliers. Univariate and multivariate outliers were investigated using several approaches. Univariate outliers for both the attachment theory and CCM analyses were identified by examining the z-scores of each variable and focusing on those that surpassed a score of +/- 3.29 (i.e., 3 *SD* from the mean). Two methods were used to identify multivariate outliers, with differing results. First, four multivariate outliers in the attachment multiple regression analyses

were identified through Mahalanobis distance using the cut-off of $\chi 2$ critical value ($df = 8$) of 26.125 at the $p < .001$ level. The second method identified any residual exceeding 3.00 as an outlier, which resulted in the identification of two multivariate outliers. Cook's distance was used to investigate the influence of the outliers on the model fit. Using the standard criterion of $\geq$ 1.0, no values were found to surpass this threshold, which suggested that no single case highly influenced the fit of the model (Cook & Weisberg, 1982; Field, 2009).

To identify multivariate outliers in the CCM analyses, identical methods to the attachment analyses were used. First, two multivariate outliers were found using the $\chi 2$ critical value ($df = 4$) of 18.467 at the $p < .001$ level. Second, two residuals were found to exceed the limit of 3.00. However, Cook's distance did not indicate any issue with the outliers influencing model fit. Research advises that without a solid justification, including a data imputation error, inclusion of a participant not from the population of study, or any error or mistake not attributable to human variability, outliers should not be removed from the analyses (Altman & Krzywinski, 2016; Williams, Grajales, & Kurkiewicz, 2013). Therefore, after carefully inspecting the data, it was decided that the outliers would be kept in the dataset.

3.4.1.3 Cases-to-independent-variables ratio. Green's (1991) frequently used equation for determining adequate cases-to-independent variable ratios in multiple regression analyses, $N \geq 50 + 8m$ (m is equal to the number of independent variables), was met. Using this rule of thumb, a sample size of $\geq$ 114 participants was needed to have adequate statistical power (i.e., Power = .80 with a critical alpha of .05). This sample size requirement was exceeded with N = 164.

3.4.1.4 Regression assumptions. Residual scatterplots between the predicted PRQ-SS and PRQ-CG dependent variables and the errors of prediction were examined to evaluate the assumptions of normality, linearity, and homoscedasticity for both sets of the multiple regression analyses. There was no evidence to suggest that any of the assumptions were violated for either the attachment theory or CCM regression analyses (Tabachnick & Fidell, 2013).

3.4.1.5 Skewness and kurtosis. Both skewness and kurtosis were evaluated using two methods: (a) visually inspecting residual histogram distributions and (b) Kline's (2010) criteria of substantial skewness over +/-3 and kurtosis +/- 10. Relationship length was the only variable found to exceed these criteria. A Log10 transformation improved the distribution of the relationship length variable. All eight multiple regression analyses (i.e., attachment theory and

CCM) were re-run using the transformed relationship length variable and the findings suggested minimal difference between the pre- and post-transformed results. Two differences emerged for the attachment analyses and no differences were found for the CCM analyses. First, a significant negative association between relationship length and SSWss was present in the post-transformed analyses and absent in the pre-transformed analyses. Second, a significant negative association between caregivers' attachment avoidance and SSPss was present in the pre-transformed analysis and absent in the post-transformed analysis. Given the main focus of the study is the attachment variables and the exceptionally minor differences between the two sets of analyses (i.e., those that included the original relationship length variable and those with the transformed variable), the pre-transformed analyses were used. The other study variables were in an acceptable range with maximum skewness values of 1.65 and kurtosis of 2.76.

No issues with multicollinearity were found. Ensuring the assumption of collinearity was met involved two steps (Field, 2009). First, the correlations amongst the independent variables for each set of the four multiple regression analyses (i.e., attachment theory and CCM) were visually inspected. This procedure revealed that the largest correlation coefficient was .47, which was well below the threshold of $\geq .80$. Second, it also involved consulting the tolerance ($< .01$), variance inflation factor (< 10), and conditional index (> 30) with a corresponding variance proportion ($> .50$) statistics, which did not suggest violations of the collinearity assumption.

3.4.2 Study 1 Descriptive Statistics

Table 3.2 presents descriptive statistics for all multi-item continuous measures and single-item follow-up question analyses used in the main study analyses. Table 3.2 also includes the scale score reliability of the multi-item measures. Several other multi-item continuous measures were used to characterize the sample. Findings from these measures are not included in Table 3.2 and are instead reported below.

3.4.2.1 Relationship descriptive statistics. Information pertaining to the nature of the romantic relationship was also collected and analyzed. Most support seekers and caregivers reported their current relationship as the "most serious [they] have ever had" (94%, 94%) and most rated the likelihood of being with their current partner in five years as likely, very likely, or extremely likely (93%, 91%). Participants completed a 7-item questionnaire designed to assess relationship satisfaction. Scores ranged between 1 and 5 with higher scores relating to more relationship satisfaction. Both support seekers ($M = 4.46$, $SD = 0.58$) and caregivers ($M = 4.41$,

SD = 0.56) reported high levels of satisfaction with their present relationship. Support seeker and caregiver reports of relationship length were combined by taking the average of the two highly correlated reports (r = .995, p < .001) and the single variable was used in the regression analyses. Relationship length ranged from 6 months to 46 years (*M* = 5.24, *SD* = 6.94). More than half of the romantic couples reported living together (60%, 59%). For those couples who stated that they did not live together, they reported spending on average nearly seven nights per month together (*M* = 6.61, *SD* = 7.23; *M* = 6.75, *SD* = 7.57).

3.4.2.2 Recent pain experience. The Bodily Pain Subscale of the SF-36 measures how much pain respondents experienced in the past four weeks and how much that pain interfered with their work. Scores for each of the two items range between 0 and 100, with lower scores indicating more severe pain and greater interference. Scores of 60 to 100 on the bodily pain item represents "*No*" to "*Mild*" bodily pain. Scores of 75 to 100 on the interference item represents interference with daily activities that is "*Not at all*" *to* "*A little bit*." On average, both support seekers (*M* = 75.67, *SD* = 18.16) and caregivers (*M* = 76.48, *SD* = 19.61) reported experiencing very little bodily pain and pain-related interference with daily activities.

Respondents also completed several questions relating to their experiences with pain in the past four weeks, year, and lifetime. The purpose of this was to establish that support seekers had experienced pain and therefore had relevant experiences to draw on while answering questions focused on wanting and receiving support during an episode of pain. When asked about experiences with pain in the past four weeks, 97% of support seekers reported having experienced some type of pain. This increased to 98.8% of support seekers reporting experiences of pain within the past year and further increased to 100% when reporting on lifetime experience with pain.

The most commonly reported types of pain experiences from the past four weeks were headache or migraine (67.5%), muscle pain (67.1%), and back pain (60.4%). Commonly reported pain experiences from the last year were dental work (29.9%), injury resulting from participation in a recreational or sporting activity (27.4%), and an accident at home, work, or elsewhere that involved an injury other than a broken bone or sprain (22.6%). In terms of commonly reported lifetime pain experiences sprain (77.4%), dental work (75%), and injury resulting from participation in a recreational or sporting activity (74.4%), were the most frequently reported.

3.4.3 Study 1 Correlation Analyses

Table 3.3 presents correlations between all the main study variables. These include the demographic variables, relationship length, and the ratings of attachment, pain catastrophizing, SSW, and SSP. The most noteworthy of these correlations are briefly reviewed below. Associations also investigated in the regression analyses are not considered in this section.

The finding with the support seeker sex variable indicated that, relative to male support seekers, female support seekers were younger, had higher levels of pain catastrophizing, and wanted more solicitous pain-related support. The correlations for the support seeker sex variable also indicated that female caregivers had lower levels of attachment avoidance and perceived themselves as providing more solicitous pain-related support in comparison to male caregivers. Relationship length was associated with several variables. Support seekers and caregivers in longer relationships reported less attachment anxiety than those in shorter relationships. Relationship length was also negatively associated with support seekers' reports regarding the amount of solicitous pain-related support they receive.

Most attachment variables were significantly correlated, which is a common finding in the literature (Cameron, Finnegan, & Morry, 2012; Fraley, Heffernan, Vicary, & Brumbaugh, 2011; Sibley et al., 2005). The correlations suggest that support seekers and caregivers higher in attachment anxiety are also higher in attachment avoidance in comparison to those lower in attachment anxiety. Correlations across relationship partners indicated that anxiously attached support seekers had partners who were both more anxiously and avoidantly attached compared to support seekers lower in attachment anxiety. In terms of avoidant attachment, more avoidantly attached support seekers had partners higher in attachment anxiety relative to those with lower attachment avoidance. It is also worth noting that support seeker and caregiver pain catastrophizing had a small statistically significant association with each other.

Several solicitous support variables were correlated. The correlation between SSWss and SSPss (r = .48) suggests that there was strong relationship between what support seekers wanted and received in terms of pain-related solicitous support. A similar level of association was also found for caregivers' perceptions of solicitous support wanted and their provision of such support. It should also be noted that caregivers' and support seekers' reports of solicitous support wanted were positively associated with each other, as were their reports of solicitous support provided.

While not the focus of the present study, but consistent with past research, support seeker attachment anxiety and support seeker catastrophizing were positively associated with each other (McWilliams & Asmundson, 2007). Therefore, relative to less anxiously attached support seekers, those higher were also more likely to engage in pain catastrophizing. This positive relationship was also found between caregiver attachment anxiety and pain catastrophizing. As well, there was a significant positive correlation between support seeker and caregiver pain catastrophizing.

3.4.4 Study 1 Regression Analyses - Attachment Theory Variables

Table 3.4 reports the findings of the models predicting SSWss and SSWcg and Table 3.5 presents the findings of the models predicting SSPss and SSPcg. The statistically significant findings of each step are reported in the tables, but only the final models are presented here. Included within the descriptions of the regression analyses are the relevant hypotheses and open research questions in abbreviated form. Table 3.1 includes the labels and a written description of the open research questions and hypotheses for Study 1.

3.4.4.1 Solicitous support wanted-support seeker report. The final model for SSWss included only Steps 1 and 2 as the addition of the interaction terms in Step 3 did not significantly improve the overall model [R^2 = .27, $F_{change}(2, 155)$ = .11, p = .90]. The final model was statistically significant [$F(6, 157) = 9.70$, $p < .001$] and accounted for 27% of the variance in the dependent variable. Support seeker sex, indicating the female in the couple assigned to the support seeker role, was positively associated with SSWss and support seekers' avoidance was negatively associated with SSWss.

This regression analysis investigated H1a, H2a, R1a, and R2a. Support seekers' reports of attachment anxiety and desire for solicitous support were not associated, so H1a was not supported. H2a was supported as the findings indicated that support seekers higher in avoidance wanted less solicitous support in comparison to those lower in this type of attachment insecurity. The findings related to the open research questions were not statistically significant, indicating that support seekers' levels of interest in solicitous support were unrelated to the attachment characteristics of their caregivers.

3.4.4.2 Solicitous support wanted-caregiver report. The final model for SSWcg is also reported in Table 3.4. It includes all three steps. The final model was statistically significant [$F(8, 155) = 3.53$, p = .001] and accounted for 15% of the variance. There was a significant

negative main effect of support seeker avoidance, a significant positive main effect for support seeker anxiety, and a significant interaction effect for the caregiver attachment anxiety and avoidance variables.

The interaction effect involving caregiver attachment anxiety and avoidance predicting SSWcg was investigated. Figure 3.1 illustrates the interaction effect by plotting predicted SSWcg scores separately for each combination of low (i.e., 1 *SD* below the mean), average (i.e., mean), and high (i.e., 1 *SD* above the mean) caregiver attachment avoidance and low and high caregiver attachment anxiety. At the low level of attachment avoidance, there was a significant negative association (b = -.12, p = < .001) between caregiver attachment anxiety and SSWcg. There were no significant effects for caregiver anxiety at either moderate (b = -.05, p = .22) or high levels (b = .02, p = .92) of caregiver avoidance. These findings indicated that caregiver attachment anxiety was negatively associated with caregiver views of solicitous support wanted by their partners, but this association was only present within those with low levels of avoidance. More specifically, caregivers low in anxiety and low in avoidance (i.e., secure attachment) viewed their partners as wanting a high level of solicitous support, whereas, caregivers high in anxiety and low in avoidance (i.e., preoccupied attachment) perceived their partners as wanting significantly less solicitous support. At the high level of caregiver avoidance, caregivers high in attachment anxiety (i.e., fearful attachment) did not differ from those low in anxiety (i.e., dismissing attachment) in terms of their reports of solicitous support wanted by support seekers.

H1b, H2b, R1b, and R2b were investigated in this regression analysis. Support seekers higher in attachment anxiety were viewed by their partners as wanting more solicitous support relative to those lower in anxiety, so H1b was supported. The findings related to the interaction effect suggest this relationship was moderated by attachment avoidance (i.e., significant at the low level of avoidance). H2b was also supported as support seekers higher in attachment avoidance were perceived by their partners as wanting less solicitous support compared to support seekers lower in attachment avoidance. The findings related to the open research questions were not statistically significant. This indicates that caregivers' attachment anxiety and avoidance were unrelated to caregivers' perceptions of solicitous support wanted.

3.4.4.3 Solicitous support provided-support seeker report. The final model for SSPss included all three steps and is reported in Table 3.5. Step 3 did not significantly improve the overall model [R^2 = .22, $F_{change}(2, 155) = 2.37$, p = .10]. However, it was included in the final

model [R^2 = .22, F(8, 155) = 5.54, p < .001] as it revealed a significant interaction effect of support seeker attachment anxiety and avoidance. The final model accounted for 22% of the variance. Relationship length, support seeker avoidance, and caregiver avoidance were all negatively associated with SSPss.

The interaction effect involving support seeker attachment anxiety and avoidance predicting SSPss was investigated. Figure 3.2 illustrates the interaction effect by plotting predicted SSPss scores separately for each grouping of three levels of support seeker attachment anxiety (low, average, and high) and two levels (low and high) of support seeker avoidance. A significant negative effect was found for attachment avoidance at both the low level (b = -.21, p < .001) and average level (b = -.15, p < .001) of attachment anxiety. At the high level of attachment anxiety, the association between avoidance and SSPss was not significant (b = -.08, p = .09). Of particular interest in this pattern of findings is that support seekers with attachment characterized by low anxiety and low avoidance (i.e., secure attachment) reported receiving significantly more solicitous support compared to those support seekers with low anxiety and high avoidance (i.e., dismissing attachment).

This regression analysis explored H4a, R5a, R6a, and H6a. Two main effects were found with one supporting a hypothesis (H6a) and the other relating to an open research question (R5a). The findings related to H6a indicate that caregivers higher in avoidance were perceived as providing less solicitous support relative to caregivers lower in avoidance. The findings related to the interaction effect suggest this relationship was moderated by attachment anxiety (i.e., stronger at low levels of anxiety). Regarding R5a, the findings indicate that support seekers higher in attachment avoidance perceived themselves as receiving less solicitous support compared to those lower in attachment avoidance. H4a was not supported and R6a was not statistically significant. These findings indicate that both support seekers' and caregivers' level of attachment anxiety were unrelated to support seekers' perceptions of solicitous support provided.

3.4.4.4 Solicitous support provided-caregiver reports. Only Steps 1 and 2 were included in the final model predicting SSPcg as the inclusion of Step 3 did not significantly improve the overall model [R^2 = .28, F_{change}(2, 155) = 1.51, p = .22]. The final model was statistically significant [R^2 = .26, F(6, 157) = 9.28, p < .001] and accounted for 26% of the variance. Both support seeker sex and caregiver avoidance were negatively associated with

SSPcg.

R4b, R5b, R6b, and H6b were examined in this regression analysis. The findings indicate that caregivers higher in attachment avoidance provided less solicitous support to their partners in comparison to caregivers lower in attachment avoidance. This supported H6b. The findings related to the open research questions were not statistically significant, indicating that the amount of solicitous support provided by caregivers was unrelated to their attachment anxiety or with the attachment characteristics of their partners.

3.4.5 Study 1 Regression Analyses - CCM Variables

Table 3.6 presents the findings of the models predicting SSWss and SSWcg, and Table 3.7 reports the findings of the models predicting SSPss and SSPcg. The statistically significant findings of each model are reported in the tables, but only the final models are presented here. Variables included in the CCM models are sex and relationship length (Step 1), and support seeker and caregiver pain catastrophizing (Step 2).

3.4.5.1 Solicitous support wanted-support seeker report. The final model for SSWss included both steps. The final model was statistically significant [$F(4, 159) = 7.04$, $p < .001$] and accounted for 15% of the variance. Both support seeker sex and support seeker pain catastrophizing had a positive association with SSWss.

This regression analysis investigated H3a and R3a. Support seekers higher in pain catastrophizing reported wanting more solicitous support than those low in catastrophizing, so H3a was supported. The finding related to R3a was not statistically significant, suggesting that the desire for pain-related solicitous support is not influenced by the degree to which one's partner engages in pain catastrophizing.

3.4.5.2 Solicitous support wanted-caregiver report. The final model predicting SSWcg included both steps. Consistent with the analyses regarding the attachment variables, Step 1 was not significant. Step 2 did contribute significantly to the model [$R^2 = .04$, $F_{change}(2, 159) = 3.28$, $p = .04$]. This final step revealed a positive association between support seeker pain catastrophizing and SSWcg. The final model was non-significant [$F(4, 159) = 1.80$, $p = .13$], but this null finding was clearly due to the presence of the Step 1 variables that were included in the model for theoretical reasons (i.e., to adjust for relationship length) and that were not statistically significant predictors.

H3b and R3b were examined in this regression analysis. Support seekers higher in pain

catastrophizing were perceived by caregivers as wanting more solicitous support than support seekers lower in pain catastrophizing. This supported H3b. The finding related to R3b was not statistically significant, suggesting that one's pain catastrophizing does not influence perceptions of how much pain-related solicitous support is wanted by one's partner.

3.4.5.3 Solicitous support provided-support seeker report. Both steps were included in the final model predicting SSPss. These findings are presented in Table 3.7. The final model was statistically significant [$F(4, 159) = 3.85$, $p = .01$) and accounted for 9% of the variance. Relationship length had a negative association with SSPss and caregiver pain catastrophizing had a positive association with SSPss.

This regression analysis examined H5a and H7a. Support seekers' levels of pain catastrophizing were not associated with their reports of solicitous support provided to them, so H5a was not supported. However, H7a was supported. This finding indicates that caregivers higher in pain catastrophizing were perceived by their partners as providing more solicitous support than caregivers lower in catastrophizing.

3.4.5.4 Solicitous support provided-caregiver report. Similar to the corresponding analyses with the attachment variables, Step 1 was statistically significant. The addition of the CCM variables in Step 2 did not result in a significant improvement [$R^2 = .09$, $F_{change}(2, 159) = 1.20$, $p = .30$] and indicated that none of the CCM variables were associated with SSPcg. Support seekers' and caregivers' level of pain catastrophizing were unrelated to caregiver reports of solicitous support provided, so neither H5b nor H7b were supported.

3.4.6 Study 1 Comparing the Attachment Theory and CCM Models

Table 3.8 presents comparisons between the attachment theory and CCM models in predicting the solicitous support variables. Both sets of variables predicted SSWss, SSWcg, and SSPss. However, on the basis of the moderate differences in effect size criterion, the attachment models were superior predictors of each of these variables. The CCM model did not predict SSPcg, so the attachment model was superior for SSPcg in addition to the first three variables (i.e., SSWss, SSWcg, and SSPss). Overall, compared to the CCM models, attachment was more strongly related to the solicitous support variables.

3.5 Follow-Up Analyses

The single-item follow-up questions were included to: (1) prepare participants for the related open-ended questions and (2) to provide another avenue of inquiry to investigate the

relationship between pain-related support using both attachment and pain catastrophizing variables. The approach to analyses was similar to those used in the main analyses (i.e., multiple regression analyses whereby support seeker sex and relationship length were entered in Step 1 and either attachment or pain catastrophizing variables entered in Step 2).

3.5.1 Single-Item Questions Data Screening

All the same data screening procedures were followed with the six sets of regression analyses (i.e., three single item questions for both support seekers and caregivers using attachment and pain catastrophizing separately). A Missing Value analyses on the single-item questions indicated minimal missingness, with a range between 0 to .02% (n = 3). Consequently, no data imputation methods were utilized. Given these questions were only a single item and no data imputation methods were utilized, each of the six questions (i.e., three single-item questions from the support seekers and three from the caregivers) had a different sample size. The sample sizes for each single-item follow-up question range from N = 161 to N = 164 with the specific values for each question included in Table 3.9.

Univariate outliers were only investigated for the dependent variables, as the independent variables (i.e., attachment theory and CCM variables) had already been screened for univariate outliers. Several univariate outliers were identified. However, because these scores corresponded to either extreme on the response scale (i.e., 1 and 6) for each single-item question, no further action was taken. Multivariate outliers were identified using the same methods used in the main analyses. These scores remained in the data set, as there was no indication that they do not belong and should be removed. Moreover, Cook's statistic did not indicate that any one score had undue influence on any of the regression models fit.

Due to issues with skewness and kurtosis, the support seeker report of satisfaction with pain-related support received variable underwent a reflected Log10 transformation. Comparisons between regression models using the non-transformed and transformed variables produced similar findings (i.e., across the models the standardized coefficients were similar in magnitude and were consistent in terms of their statistical significance). Therefore, the findings from the non-transformed support seekers' satisfaction variable are presented.

Regression assumptions were investigated by visually inspecting the residual scatterplots between the predicted support seeker and caregiver single-item question dependent variables (i.e., satisfaction with support, skill in identifying pain, and comfort in requesting support) and

the errors of prediction to evaluate the assumptions of normality, linearity, and homoscedasticity for both sets of the multiple regression analyses. Three scatterplots appeared to violate the assumption of normality. A non-normal distribution can make it more difficult to ascertain the presence of a relationship between variables (Williams et al., 2013). However, normally distributed residuals are not always necessary with larger sample sizes and when the other assumptions are met (Williams et al., 2013). The three non-normal regression analyses were also found to have acceptable skewness and kurtosis statistics and were extremely non-significant. Consequently, no attempts were made to correct for the non-normality of residuals.

3.5.2 Single-Item Questions: Descriptive and Correlation Analyses

The average ratings provided suggest that support seekers are quite satisfied with the support they receive from their partners (M = 5.31, SD = 1.14), believe their partners are relatively skilled in knowing when they are experiencing pain (M = 4.93, SD = .94), and are quite comfortable asking for support from their partners (M = 5.09, SD = 1.24). For caregivers, the average ratings provided suggest that caregivers believe their partners are reasonably satisfied with the support they provide (M = 4.77, SD = 1.15), find knowing when their partners are experiencing pain reasonably easy (M = 4.55, SD = 1.33), and view their partners as somewhat comfortable asking for help when they are in pain (M = 4.26, SD = 1.48).

With one exception, the demographic variables had small associations with the single-item questions that were not statistically significant. These associations ranged from an absolute value of 0 to .11. The one exception was a significant positive association between support seeker sex and caregiver comfort (r = .20, $p = \leq .01$), which indicates that female support seekers were perceived by their partners as more comfortable asking for support than were the male support seekers.

The correlations between the single-item variables are reported in Table 3.9. Seven of the 15 correlations were statistically significant. The pattern of findings suggests that support seekers' perceptions of their partners' skill at recognizing their pain is important. This variable (i.e., SS Skill) was positively associated with support seekers' and caregivers' reports of satisfaction with pain-related support and with support seekers' reports of comfort asking for pain-related support. The correlations also indicated that caregivers' perceptions of their partners' comfort in asking for pain-related support were positively associated with caregivers' perceptions of their partners' satisfaction with support and their own skill at providing support.

Support seekers' and caregivers' ratings of support seekers' comfort in asking for support were also positively associated. Lastly, there was a positive association between support seekers' comfort asking for pain-related support and caregivers' perceptions of their partners' satisfaction with support.

Several of the main study variables (i.e., attachment theory and CCM variables) and the single-item follow-up questions were correlated with the single-item variables. These correlations are also presented in Table 3.9. However, these associations are considered in more detail in the following regression analyses.

3.5.3 Single-Item Questions Regression Analyses - Attachment Theory Variables

To examine the relationships between the independent variables and dependent variables in a manner that addresses the interdependence between the relationship partners, these associations were examined using multiple regression analyses. Table 3.10 presents the findings of the models predicting the single-item follow-up questions as reported by support seekers and caregivers. The statistically significant findings of each model are reported in the tables, but only the final models are presented here.

3.5.3.1 Satisfaction with support-support seeker report. Neither steps of the model predicting satisfaction as reported by support seekers was significant [R^2 = .03, F(6, 154) = .93, p = .48]. None of the attachment variables were related to support seekers' reports of satisfaction with the pain-related support they receive from their partners.

3.5.3.2 Satisfaction with support-caregiver perception. The overall model predicting support seekers' satisfaction with pain-related support as reported by caregivers included both steps. Step 1 did not contribute significantly to the model [R^2 = .01, F(2, 161) = .44, p = .64]. However, Step 2 did significantly contribute [R^2 = .15, F_{change}(4, 157) = 6.67, p < .001]. The final model was statistically significant [F(6, 157) = 4.61, p < .001] and accounted for 15% of the variance. It revealed negative associations between both caregiver anxiety and avoidance, and caregivers' reports of satisfaction with pain-related support. This pattern of findings indicates that those higher in attachment anxiety and avoidance perceived themselves as providing less satisfactory pain-related social support relative to those lower in attachment anxiety or avoidance.

3.5.3.3 Skill in identifying pain-support seeker report. Both steps were included in the final model predicting caregivers' skill in knowing when their partners are experiencing pain as

reported by support seekers. Step 1 [R^2 = .01, F(2, 159) = .80, p = .45] was not a statistically significant contributor to the final model, whereas Step 2 was [R^2 = .08 F_{change}(4, 155) = 3.11, p = .02]. The final model was statistically significant [F(6, 155) = 2.35, p =.03] and accounted for 8% of the variance. It revealed a negative association between support seeker avoidance and caregiver skill as reported by support seekers. This indicates that those higher in avoidance view their partners as being less skillful at recognizing their pain relative to those lower in avoidance.

3.5.3.4 Skill in identifying pain-caregiver perception. Both Step 1 and 2 were included in the final model predicting caregivers' reports of skill in knowing when their partners are experiencing pain. Step 1 did not contribute significantly to the model [R^2 = .01, F(2, 158) = .45, p = .64], while Step 2 did [R^2 = .10, F_{change}(4, 154) = 3.79, p = .01]. Overall, the final model was statistically significant [F(6, 154) = 2.69, p = .02] and accounted for 10% of the variance. It revealed a negative association between support seeker avoidance and caregivers' reports of their ability to know when their partners are experiencing an episode of pain. This indicates that those lower in attachment avoidance were perceived as being more easily understood with regard to pain experiences than those higher in attachment avoidance.

3.5.3.5 Comfort in requesting support-support seeker report. The final model predicting support seekers' reports of comfort in asking for pain-related support included both steps. Step 1 was not a significant contributor to the final model [R^2 = .00, F(2, 159) = .24, p = .79], whereas Step 2 was [R^2 = .11, F_{change}(4, 155) = 4.74, p = .001]. The final model was significant, [F(6, 155) = 3.25 p = .01] and accounted for 11% of the variance. It revealed a negative association between support seeker avoidance and support seekers' reports of comfort in asking for pain-related support as reported. This finding indicates that those higher in attachment avoidance were less comfortable asking for support during experiences of pain than those lower in avoidance.

3.5.3.6 Comfort in requesting support-caregiver perception. Both steps were included in the final model predicting caregivers' reports of their partners' comfort in asking for pain-related support. The final model was statistically significant [F(6, 156) = 3.79, p = .001] and accounted for 13% of the variance in the dependent variable. It showed that partners' comfort in asking for pain-related support as reported by caregivers was positively associated with support seeker sex and negatively associated with both support seeker and caregiver avoidance. This suggests that females were more comfortable asking directly for pain-related support than males.

It also indicates that caregivers higher in attachment avoidance perceived their partners as less comfortable asking for support relative to those lower in attachment avoidance and that support seekers higher in avoidance were perceived by their partners as less comfortable asking for pain-related support than those lower in avoidance.

3.5.4 Single-Item Questions Regression Analyses - CCM Variables

There were six regression analyses predicting the single-item questions for both support seekers and caregivers using the CCM variables. Four of these analyses produced final models that were not statistically significant. There was also one final model that was marginally statistically significant and one that was statistically significant.

The final model (i.e., including Steps 1 and 2) predicting support seeker satisfaction with pain-related support as reported by support seekers [R^2 = .03, F(4, 156) = 1.05, p = .38] was statistically non-significant. Similarly, the final model predicting caregiver perception of satisfaction with pain-related support was also statistically non-significant [R^2 = .02, F(4, 159) = .69, p = .60].

Step 2 of the model predicting caregivers' skill in knowing when their partners are experiencing pain as reported by support seekers was marginally significant [R^2 = .04, F_{change}(2, 157) = 2.53, p = .08] and revealed a negative association between support seeker pain catastrophizing and the dependent variable (β = -.17, p = .04). This finding indicates that support seekers higher in pain catastrophizing reported their partners as having less skill in knowing when they were experiencing pain compared to those lower in pain catastrophizing. The overall model was statistically non-significant [F(4, 157) = 1.67, p = .16]. The model predicting caregivers' reports of skill in knowing when their partners are experiencing pain was non-significant [R^2 = .01, F(4, 156) = .48, p = .78].

In terms of predicting support seekers' comfort in asking for pain-related support, the model regarding support seeker reports was statistically non-significant [R^2 = .00, F(4, 157) = .17, p = .96]. However, the model predicting support seekers' comfort in asking for support during an episode of pain as reported by caregivers included both Step 1 [R^2 = .05, F(2, 160) = 4.38, p = .01] and Step 2 [R^2 = .09, F_{change}(2, 158) = 3.25, p = .04]. Overall, the final model was statistically significant [F(4, 158) = 3.88, p = .01] and accounted for 9% of the variance. Both support seeker sex (β = .19, p = .02) and support seeker pain catastrophizing had a positive association with caregivers' reports of their partners' comfort in asking for support during an

episode of pain. However, the association between support seeker pain catastrophizing and the dependent variable did not reach the threshold to be considered statistically significant (β = .14, p = .10). These findings indicate that females were perceived by caregivers as more comfortable asking for pain-related support relative to males.

3.5.5 Single-item Questions Comparing the Attachment and CCM Models

Comparisons between attachment theory and CCM models predicting the single-item follow-up questions (i.e., satisfaction with support, skill in identifying pain, and comfort in requesting support) are presented in Table 3.11. Attachment was more strongly related to caregiver satisfaction ratings, support seeker and caregiver skill ratings, and support seeker comfort ratings. In all four cases, the attachment regression models predicting the dependent variable were significant, while the CCM models were not significant. The attachment theory and CCM models were considered equal in support seeker ratings of satisfaction and caregiver ratings of comfort based on either an absence of a moderate effect size difference between the models (caregiver comfort ratings) or the absence of significant findings for both models (support seeker satisfaction ratings). Overall, models including the attachment-related variables better predicted the single-item follow-up questions compared to those including the pain catastrophizing variables.

CHAPTER 4: STUDY 2

4.1 Purpose of Study 2

Study 2 examined both attachment and pain catastrophizing variables in relation to the solicitous pain-related support preferences (i.e., solicitous support wanted and provided) of a sample of patients seeking treatment for chronic pain. The methodology was similar to that of Study 1, but Study 2 relied solely on reports obtained from the support seekers (i.e., chronic pain participants), so caregiver variables could not be investigated. The primary aim of Study 2 was to determine whether the relationships identified in the non-clinical sample of Study 1 were also present amongst those with chronic pain.

4.2 Study 2 Hypotheses

The hypotheses were based on the same body research as those of Study 1. Therefore, they were very similar. However, the Study 2 hypotheses were less complex as there were no hypotheses from the caregiver perspective or related to their attachment characteristics. In order to be consistent with the abbreviations used in Study 1, SSW is again used to denote support seekers' reports of solicitous support wanted and SSP denotes the participants' (i.e., support seekers') perceptions of solicitous support provided to them. Given that there were no reports from caregivers, "ss" is not included as part of this abbreviations. The hypotheses and open research questions are briefly summarized in the following subsections. As well, they are listed in Table 4.1.

4.2.1 Solicitous Support Wanted

Based on previous research, it was expected that attachment anxiety would be positively associated with SSW (H8), and that attachment avoidance would be negatively associated SSW (H9; Bailey et al., 2015). Pain catastrophizing has been associated with support seekers' desire for solicitous support (McWilliams et al., 2014). Therefore, a positive association between pain catastrophizing and SSW was hypothesized (H10).

4.2.2 Solicitous Support Provided

Based on previous research findings, anxious attachment was expected to be negatively associated with SSP (H11), and no hypothesis was proposed for avoidant attachment and SSP (R7; Bailey et al., 2015). Support seekers' pain catastrophizing has been associated with an absence of subjective social support, critical responding from partners, and an absence of subjective social support received (Boothby et al., 2004; Keefe et al., 2003). Therefore, it was

expected that pain catastrophizing would be negatively associated with SSP (H12).

4.2.3 Pain Duration

Pain duration is important to study because it has been found to moderate the relationship between pain catastrophizing and chronic pain patients' perceptions of solicitous support received. One study found a weaker association between pain catastrophizing and solicitous support received at longer pain durations compared to shorter pain durations (Buenaver et al., 2007). Another study found a positive relationship between the two variables at a shorter pain duration, but not a longer duration (Cano, 2004). Given these statistically significant findings, it is possible that pain duration might moderate the relationship between pain catastrophizing and SSP. However, in light of the mixed findings, this relationship was treated as an open research question (R8). Although no specific hypotheses or research questions were proposed, the potential moderating effects of pain duration on the other dependent variables (i.e., attachment anxiety, attachment avoidance, and pain catastrophizing) were examined.

4.3 Study 2 Methods

4.3.1 Study 2 Participants

The second study was conducted with archival data from a study of pain-related support, disability, and relationship satisfaction involving a sample (N = 147) of adults that experienced chronic pain and that were in a relationship (McWilliams et al., 2017). The sample consisted of more females (63%) than males (37%), with ages ranging from 18 to 83 years (M = 49.46, SD = 13.51), who identified as White (86%), Native Canadian [sic] (6%), Asian (1%), or Other (7%). Most participants were married or in a common-law relationship (82%), with the remaining all involved in a relationship (18%). Employment status varied with nearly an even split between employed full-time (29%) and on sick or medical leave (28%), while the remaining participants were reportedly unemployed (16%), retired (16%), employed part-time (7%), or students (1%).

4.3.2 Study 2 Procedure

Ethical approval for the initial data collection was obtained from the Health Research Ethics Board at the University of Alberta. They also granted approval for the secondary use of the de-identified archival data in the current program of research. Further ethical approval was not required from the Research Ethics Board at the University of Saskatchewan to use the de-identified archival data. All participants were recruited while waiting for appointments at the University of Alberta Pain Clinic. They completed a similar set of measures to those used in

Study 1, which included the PCS (page 44), PRQ-SS (page 45), and the RAS (page 45). Measures unique to Study 2 are listed below

4.3.3 Study 2 Measures

4.3.3.1 Pain experiences. To characterize the sample in terms of their pain experience, several questions were asked regarding their pain and medical history. They were asked to: (a) indicate how their current pain problem began (e.g., motor vehicle accident, accident at home, accident at work, after an illness), and (b) where in their body they experience the most pain (e.g., head/face/mouth, shoulders, arms/hands, chest, lower back/lumbar spine). Participants were also given a list of statements describing pain (e.g., always present – always the same intensity, often present – have short periods without pain, infrequently present – have pain every few days or weeks) and were asked to indicate which best described their pain experience.

4.3.3.2 Pain severity. A 4-item rating scale was used to assess pain severity. Participants were instructed to first rate their current level of pain followed by their worst, least, and average pain experienced during the past week. Each item was rated using an 11-point Likert scale ranging from 0 (*No pain*) to 10 (*Worst Pain Imaginable*). Research found that 0 to 10 pain intensity rating scales relating to current, worst, least, and average pain are psychometrically strong enough to be employed in chronic pain research (Jensen, Turner, Romano, & Fisher, 1999).

4.3.3.3 Pain Disability Index (PDI). The PDI (Pollard, 1984) is a 7-item self-report measure used to assess the extent to which participants' pain interferes in seven different areas of their daily living, including family/home responsibilities, recreation, social activity, occupational, sexual behaviour, self-care, and physical health (i.e., eating, sleeping, and breathing). For each seven daily living areas participants were asked to rate their disability level on 11-point Likert scales ranging from 0 (*No disability*) to 10 (*Total disability*). Previous research has found the PDI to have good scale score reliability at or above .86 and significantly correlated with other objective and subjective measures of disability (Grönblad et al., 1993; Tait, Chibnall, & Krause, 1990; Tait, Pollard, Margolis, Duckro, & Krause, 1987). Several studies have provided support for the construct and concurrent validity of this measure (Tait et al., 1990; Tait et al., 1987). One study (Tait et al., 1990) found the test-retest reliability of the PDI to be low (r = .44) at a 2-month follow-up, while another study (Grönblad et al., 1993) reported a much higher reliability statistic (r = .91) after a 1-week period. Tait et al. (1990) attributed the

lower reliability to the study's small sample size and/or variability in the follow-up time (e.g., between 11 and 307 days between retesting).

4.3.3.4 Pain duration. Pain duration was measured using a single item (*"How many months or years have you had your current pain problem?"*). Respondents were instructed to include the number of months or years the pain had been experienced.

4.3.3.5 Experiences in Close Relationships Inventory – Short Form (ECR-S). The ECR-S (Wei, Russell, Mallinckrodt, & Vogel, 2007) is a 12-item self-report measure used to assess participants' attachment. The two subscales anxiety (sample item, "*I worry that romantic partners won't care about me as much as I care about them*") and avoidance (sample item, "*I want to get close to my partner, but I keep pulling back*") are each comprised of six-items rated on a 7-point Likert scale ranging from 1 (*Definitely not like me*) to 7 (*Definitely like me*). The ECR-S has good levels of scale score reliability for both subscales: anxiety (α = .85) and avoidance (α = .74) over a three-week period, and good test-retest reliability scores at a 3-week period, anxiety (r = .82) and avoidance (r = .89). In addition, there was considerable support for the validity of the measure (Wei et al., 2007).

4.3.4 Study 2 Analyses

Study 2 was similar to Study 1 in terms of the statistical analyses used. However, there were two major differences between the studies in terms of the analyses. First, the number of dependent variables varied between the two studies. Study 1 had four dependent variables (two from the support seekers' perspective and two from the caregivers' perspective), whereas data were only collected from support seekers in Study 2 and, as such, there were only two dependent variables (i.e., SSW and SSP). Second, in Step 1 of the hierarchical regression models, pain severity, pain duration, and pain disability were included as covariates along with support seeker sex and relationship length. Step 2 included the attachment variables (i.e., attachment anxiety and avoidance) in one pair of models and pain catastrophizing in another pair of models. For the analyses with the attachment variables, Step 3 included the two-way interaction terms (i.e., attachment anxiety x attachment avoidance, anxiety x pain duration, and avoidance x pain duration) and Step 4 included the three-way interaction term (i.e., anxiety x avoidance x pain duration). For analyses with the pain catastrophizing variable, the two-way interaction between the PCS total scores and pain duration were included in Step 3. The same criteria used in Study 1 to determine which model better predicts support seekers' pain-related support preferences was

used in Study 2.

4.4 Study 2 Results

4.4.1 Study 2 Data Screening

Data from Study 2 underwent the same screening procedures as Study 1. According to Green's (1991) equation for adequate cases-to-independent variables ratio, the sample size required for Study 2 was ≥ 138, which was exceeded with $N = 147$. In terms of missing data, very few were found to be missing in Study 2. Only two items associated with the Pain Disability Index had any missing data, and missingness ranged from .01 to .03%. In those few cases, participants' total scores on the measure were obtained by omitting the item and taking the mean of the remaining items. The relationship length variable was missing two responses. In those two cases, the expectation-maximization method of data imputation was used.

Three univariate outliers were identified using the criterion of z-scores ≥ 3.29. However, because these scores occurred due to extensive range of the pain duration variable, they were not removed from the data set. Multivariate outliers were identified using the same methods as previously discussed, which were through Mahalanobis distance and examining residuals. Seven multivariate outliers were found using Mahalanobis distance statistics with five in the attachment variables [cut-off $\chi 2$ critical value (df =11) of 31.264, $p < .001$] and two in the CCM [cut-off $\chi 2$ critical value ($df = 7$) of 24.322, $p < .001$] multiple regression analyses. Residuals surpassing 3.00 were defined as outliers. Two residuals exceeded this defined value. Cook's distance was used to explore the influence of the outliers on the models' fit. One case was found to surpass the criterion of ≥ 1.0 (Cook & Weisberg, 1982; Field, 2009). This case was further examined. However, as has been the case with the Study 1 analyses, a solid rationale is necessary to remove an outlier from the sample and there was no justification to remove this participant from the analyses.

Residual scatterplots between the predicted PRQ-SS and errors of prediction were examined for non-linearity, non-normality, and heteroscedasticity. Visual inspection of the scatterplots did not indicate any issues with the assumptions of linearity, normality and homoscedasticity (Tabachnick & Fidell, 2013). Both skewness (+/- 3) and kurtosis (+/- 10) statistics were within an acceptable range with a maximum skewness value of 1.90 and kurtosis value of 3.62. No issues with multicollinearity were found. Correlations among independent variables did not exceed .48, which is much lower than the criterion of .80. In addition,

examination of tolerance, variance inflation factor, and conditional index statistics did not reveal violation of the collinearity assumption.

4.4.2 Study 2 Descriptive Statistics

Descriptive statistics for the main study variables are reported in Table 4.2. Where appropriate, scale score reliability coefficients are also reported in Table 4.2. In addition to the main variables reported in Table 4.2, several other descriptive statistics were collected in order to characterize the sample. Participants reported having been in primarily long-term relationships (M = 21.11 years, SD = 15.44 years). Scores on the RAS indicated that on average participants in Study 2 were fairly satisfied with their romantic relationships (M = 4.00, SD = 1.00). Participants also reported on several other details of their pain. In terms of what preceded their current pain problem, many participants reported their pain problems began without an identifiable event or cause (27%), followed by accident at work (18%), other accident (18%), motor vehicle accident (15%), multiple causes (10%), after an illness (7%), and accident at home or other accident (5%). Most frequently cited body areas affected by pain were lower back or lumbar spine (27%); legs or feet (15%); head, face, or mouth (12%); abdomen region (8%); and joints (8%). Description of pain experience most frequently endorsed was "always present with varied intensity" (74%), followed by "often present with short pain-free periods" (10%), and "always present with same intensity" (9%).

4.4.3 Study 2 Correlation Analyses

Correlations between the main study variables are reported in Table 4.3. The statistically significant correlations are highlighted here. The correlations regarding support seeker sex indicated that females reported higher levels of disability and a greater desire for solicitous support relative to what was reported by males. Disability was positively associated with attachment anxiety, attachment avoidance, and pain catastrophizing. Pain severity was positively associated with pain catastrophizing. Negative correlations indicated that support seekers higher in attachment anxiety, attachment avoidance, and pain catastrophizing all reported receiving less solicitous support than those low in attachment anxiety, attachment avoidance, and pain catastrophizing.

4.4.4 Study 2 Regression Analyses – Attachment Theory Variables

Table 4.4 reports the findings of the models predicting SSW and SSP with the variables related to attachment theory. The statistically significant findings of each model are reported in

the tables, but only the final models are described here. Relevant hypotheses and open research questions are included in abbreviated form within the regression analyses descriptions. Table 4.1 includes the labels and a written description of the open research questions and hypotheses for Study 2.

4.4.4.1 Solicitous support wanted. The final model for SSW included both Step 1 (support seeker sex, relationship length, pain duration, pain severity, and disability) and 2 (attachment anxiety and avoidance). The addition of Step 2 only made a marginally significant improvement to the model [R^2_{change} = .03, $F_{change}(2, 139) = 2.78$, $p = .07$], but it revealed a negative association between attachment avoidance and SSW. The final model was statistically significant [$R^2 = .21$, $F(7, 139) = 5.13$, $p < .001$] and accounted for 21% of the variance in the dependent variable. Female sex was also positively associated with SSW in this model. Inclusion of the four interaction terms involving attachment anxiety, attachment avoidance, and pain duration in Step 3 [$R^2 = .23$, $F_{change}(3, 136) = 1.39$, $p = .25$] and 4 [$R^2 = .23$, $F_{change}(1, 135) = .03$, $p = .87$] did not significantly improve the overall model.

This regression analysis investigated H8 and H9. Support seekers' level of attachment anxiety was unrelated to their reports of solicitous support wanted, so H8 was not supported. H9 was supported; support seekers higher in attachment avoidance reported wanting less solicitous support than those lower in avoidance.

4.4.4.2 Solicitous support provided. The final model predicting SSP with the attachment variables included all four steps and is reported in Table 4.4. In Step 2, a main effect of attachment avoidance was found. Step 3 did not contribute significantly to the model [$R^2 = .28$, $F_{change}(3, 136) = .62$, $p = .61$]. However, the inclusion of the three-way interaction term in Step 4 improved the overall model and revealed a significant interaction between attachment anxiety, attachment avoidance, and pain duration [$R^2 = .30$, $F_{change}(1, 135) = 4.10$, $p = .05$]. Avoidance remained negatively associated with SSP in this model. The final model was statistically significant [$F(11, 135) = 2.13$, $p < .001$] and accounted for 30% of the variance.

The three-way interaction effect involving attachment anxiety, attachment avoidance, and pain duration predicting SSP was investigated further. This interaction effect is illustrated in Figure 4.1 by plotting predicted scores of SSP for each combination of low (i.e., 1 *SD* below the mean) and high (i.e., 1 *SD* above the mean) attachment anxiety, attachment avoidance, and pain duration. Attachment avoidance was generally negatively associated with SSP. This was the case

in three of the combinations of pain duration and anxiety, namely short pain duration and high anxiety (b = -.39, p < .001), long pain duration and low anxiety (b = -.53, p = .001), and long pain duration and high anxiety (b = -.35, p = .001). At the short pain duration level and low anxiety, there was also a negative association, but it was only marginally significant (b = .22, p = .08).

H11 and R7 were examined in this regression analysis. Support seekers' attachment anxiety levels were unrelated to their perceptions of solicitous support provided, so H11 was not supported. A statistically significant main effect was found in relation to R7. It indicated that support seekers higher in attachment avoidance perceived themselves as receiving less solicitous support relative to those lower in attachment avoidance. The findings regarding the three-way interaction effect suggest that this relationship may be moderated by attachment anxiety and pain duration.

4.4.5 Study 2 Regression Analyses – CCM Variables

Table 4.5 reports the findings of the models predicting SSW and SSP with the variables related to the CCM. The statistically significant findings of each model are reported in the tables. However, only the final models are described here.

4.4.5.1 Solicitous support wanted. Similar to the corresponding analyses with the attachment variables, Step 1 was statistically significant in the model predicting SSW. The addition of pain catastrophizing in Step 2 did not significantly improve the model [R^2 = .18, $F_{change}(1, 140) = 1.55$, p = .22]. This was also the case with the addition of the interaction term (i.e., pain catastrophizing by pain duration) in Step 3 [R^2 = .18, $F_{change}(1, 139) = .00$, p = 1.00]. Contrary to the hypothesized positive association (i.e., H10), the null finding indicated that support seeker pain catastrophizing and desire for solicitous support were not related to each other.

4.4.5.2 Solicitous support provided. The final model for SSP includes both Step 1 and 2. Similar to the corresponding analyses with the attachment variables, Step 1 did not contribute significantly to the model. The final model was not statistically significant [R^2 = .07, $F(6, 140) = 1.66$, p = .14], the addition of Step 2 did significantly improve the model [R^2 = .07, $F_{change}(1, 140) = 6.29$, p = .01] and revealed a negative association between pain catastrophizing and SSP (β = -.23, p = .01). Step 3 did not significantly improve the overall model [R^2 = .07, $F_{change}(1, 139) = .16$, p = .69] and was not included.

H12 and R8 were investigated in this regression analysis. Support seekers higher in pain catastrophizing reported received less solicitous support relative to those lower in pain catastrophizing. This supported H12. There were no statistically significant findings relating to R8, indicating that pain duration did not moderate the relationship between pain catastrophizing and perceptions of solicitous support received.

4.4.6 Study 2 Comparing the Attachment Theory and CCM Models

Comparisons between the models related to attachment theory and the CCM are presented in Table 4.6. Attachment was more strongly related to both dependent variables. In the case of SSW, the attachment model was statistically significant while the CCM model was not. For SSP both models produced statistically significant findings, but there was a moderate effect size difference between models favouring attachment. Overall, attachment, compared to the catastrophizing, better predicted the dependent variables in Study 2.

CHAPTER 5: DISCUSSION

Since Fordyce and colleagues' (1968) seminal study focused on one interpersonal aspect of chronic pain (i.e., the operant conditioning of pain behaviour), there has been significant interest in psychosocial factors relevant to the development and maintenance of chronic pain. One of the most well-known and highly researched theoretical frameworks for investigating the interpersonal aspects relevant to the experience of pain is the communal coping model of pain catastrophizing (CCM; Sullivan et al., 2001). The CCM posits that pain catastrophizing is triggered during real or expected pain and influences the experience of pain. Moreover, according to the CCM, individuals' high in pain catastrophizing display more pain behaviours to elicit social support from those around them with the purpose of having their pain managed in an interpersonal context (Sullivan, 2012).

Attachment theory has also been proposed as a framework for understanding the interpersonal aspects of chronic pain (Bowlby, 1969). Attachment theory states that starting at birth, interactions with primary attachment figures influence support-seeking behaviour throughout the lifespan (Bowlby, 1969; Mikulincer & Shaver, 2009; Shaver & Mikulincer, 2007). In general, early experiences with attachment figures characterized by warmth and responsiveness are said to lead to secure attachment, whereas inconsistent or neglectful care is theorized as resulting in the development of insecure attachment. Insecure attachment has been suggested by several researchers as underlying both pain catastrophizing and interpersonal pain-related behaviours (Ciechanowski et al., 2003; McWilliams & Holmberg, 2010). Based on the idea that attachment insecurity may be a more fundamental influence on social behaviour than pain catastrophizing, the present studies compared the strengths of the relationships between several key interpersonal variables (i.e., preferences for solicitous support and perceptions of support provided) that are thought to play a role in both the development and maintenance of chronic pain and variables relevant to attachment theory (i.e., attachment anxiety and avoidance) and the CCM (i.e., pain catastrophizing). This program of research aimed to provide a systematic assessment of these relationships by directly comparing the strengths of these relationships in both a non-clinical sample (Study 1) and a sample of individuals with chronic pain (Study 2).

5.1 Study 1 Discussion

Study 1 investigated pain-related support preferences and perceptions of support provided in a non-clinical sample of romantic couples. The purpose of this study was three-fold. First, it

was intended to replicate Bailey et al.'s (2015) study, which was the first to use a dyadic approach (i.e., a sample of relationship partners) to examine relationships between attachment characteristics and perceptions of solicitous support wanted and provided. Second, the study aimed to investigate the potential influence of pain catastrophizing on pain-related support. Aside from one clinical study that examined both partners' pain catastrophizing in relation to the pain behaviour of chronic pain partners, no other studies have investigated pain-relevant interpersonal variables associated with both partners' level of pain catastrophizing (Gauthier et al., 2011). Third, the present study intended to uniquely contribute to the literature by directly comparing findings related to the CCM and attachment theory in order to determine which of these two frameworks is the most promising for understanding and predicting pain-related interpersonal behaviour.

5.1.1 Study 1 Attachment Theory Variables

5.1.1.1 Attachment theory-solicitous support wanted. Given that individuals with anxious attachment tend to engage in hyperactivation as a secondary attachment strategy (Mikulincer & Shaver, 2007) and Bailey et al.'s (2015) findings, it was hypothesized that support seeker anxiety would be positively associated with a desire for solicitous support (i.e., SSWss; H1a). Surprisingly, support seeker anxiety was unrelated to this variable. Consistent with the previous study, caregiver perceptions of solicitous support wanted by their partners (i.e., SSWcg) was positively associated with support seeker attachment anxiety (H1b; Bailey et al., 2015). This pattern of findings suggests that anxious individuals do not have a heightened desire for solicitous support relative to those that are less anxious, but they are nonetheless perceived by their partners as wanting a relatively higher level of such support. This discrepancy should not be surprising as Craig's (2009, 2015) social communication model of pain emphasizes the difficulty in accurately decoding pain expression and the potential for decoding errors based on interpersonal and intrapersonal factors of both the pain sender and receiver. One possible explanation for this pattern of findings is that the hyperactivating style characteristic of anxiously attached individuals is a fairly automatic or reflexive response to pain that is particularly salient to those around them. This hyperactivating response might be interpreted as a desire for support but is not necessarily indicative of a conscious desire for that type of support by those high in attachment anxiety.

Avoidantly attached individuals have consistently demonstrated a preference for coping

with stressful experiences by shunning interpersonal support and engaging in compulsive self-reliance (Mikulincer & Orbach, 1995; Mikulincer & Shaver, 2003). Based on this view of attachment avoidance and Bailey et al.'s (2015) findings, support seeker avoidance was hypothesized to be negatively associated with both SSWss (H2a) and SSWcg (H2b). Both hypotheses were supported. This suggests that avoidant support seekers prefer less pain-related support and are also successful in communicating this preference to their partners. However, it should be noted that this communication may be rather indirect and could even involve behaviour towards partners that is aversive and likely to lead to low levels of support.

Previous research has suggested that caregiver attachment may play a role in the pain experience of their partners. For example, one study found that women in relationships where both partners were characterized by high attachment anxiety reported the most subjective pain in an experimental pain task (Wilson & Ruben, 2011). Avoidantly attached caregivers have been found to engage in support giving behaviours that are lacking in sensitivity, warmth, and accessibility, and anxiously attached caregivers are reportedly at times providing care that is compulsive, overwhelming, and also lacking in sensitivity (Kunce & Shaver, 1994). Therefore, it is possible that these less-than-ideal caregiving styles could influence what the partners of avoidant and anxious individuals want in terms of pain-related support. However, without research to support this speculation and given Bailey et al.'s (2015) null findings related to this topic, no hypotheses were proposed regarding relationships between caregiver attachment and SSWss. Instead, these potential relationships were left as open research questions. No relationships were found between either caregiver attachment anxiety and avoidance and SSWss (R1a and R2a). In short, these findings suggest that preferences regarding pain-related social support are likely intraindividual in nature and largely independent of the abilities and characteristics of one's partner.

Relationships between caregiver attachment and SSWcg were also investigated. These relationships were investigated as open research questions (Bailey et al., 2015). Consistent with Bailey et al.'s (2015) findings, caregiver attachment anxiety (R1b) and avoidance (R2b) were unrelated to SSWcg. There was, however, a significant interaction effect of caregiver anxiety and avoidance on caregiver perceptions of the level of solicitous support wanted by their partners. When exploring interaction effects, it is possible to utilize the categorical attachment style names to refer to the four possible combinations of high and low anxiety and avoidance (i.e., secure,

preoccupied, dismissing, and fearful). This approach indicated that securely attached (i.e., low anxiety and low avoidance) caregivers reported their partners as wanting more solicitous support than did caregivers characterized with preoccupied attachment (i.e., high anxiety and low avoidance). Given that the caregiver attachment variables were not associated with the SSWss, it seems unlikely that this finding is due to a relationship between caregivers' attachment characteristics and the amount of solicitous support wanted by support seekers. Instead, caregivers' attachment characteristics might shape their impressions of the support wanted by their partners.

5.1.1.2 Attachment theory-solicitous support provided. If attachment characteristics influence support preferences and the communication of such preferences, attachment characteristics could also be related to the amount and type of support received. Past research investigating support seeker attachment and perceptions of solicitous support received has been mixed. One study with chronic pain patients did not find an association between support seekers' attachment anxiety and their perceptions of solicitous support received but did find a negative association between it and attachment avoidance (Gauthier et al., 2012). In contrast, Bailey et al. (2015) found a negative association between support seeker attachment anxiety and solicitous support received as reported by support seekers with no relationship found for attachment avoidance. In Study 1, all hypotheses relating to solicitous support received were based on Bailey et al.'s findings. Inconsistent with what was hypothesized (H4a), support seeker attachment anxiety was not significantly associated with SSPss. However, consistent with Gauthier et al.'s findings, support seeker avoidance was negatively associated with SSPss (R5a).

There was also a statistically significant support seeker anxiety by avoidance interaction effect for SSPss. The negative association between support seeker avoidance and SSPss was moderated by support seeker attachment anxiety. This negative association was stronger at low levels of anxiety (i.e., a relatively large difference between secure and dismissing styles) relative to the association found at higher levels of anxiety (i.e., a relatively small difference between preoccupied and fearful styles). These findings suggest that securely attached support seekers perceived themselves as receiving the highest amount of solicitous support compared to all other attachment styles. The operant conditioning model emphasizes the potential negative effects of solicitous support, such as increased pain-related disability (Fordyce et al., 1968). In contrast, the positive association between solicitous support and attachment security highlights its potential

value. Cano and Williams (2010) conceptualized pain-related solicitous support and empathetic responding in romantic couples using Reis and Shaver's (1988) model of the intimacy process. They suggested that providing pain-related interpersonal support deepens intimacy within couples and helps with the processing of stress. Several studies support this idea and have found solicitous support to be positively related to relationship satisfaction (Cano et al., 2008; McWilliams et al., 2017).

Given that Bailey et al. (2015) did not find relationships between support seekers' attachment variables and caregivers' reports of solicitous support provided, these relationships were left as open research questions in the current study (R4b and R5b). Consistent with the earlier null findings, both support seeker anxiety and avoidance were unrelated to SSPcg. These findings suggest that support seeker attachment characteristics do not influence the amount of support caregivers perceive themselves as providing. It could be that caregivers are more influenced by their own needs when providing pain-related support than they are by the needs of their partners. More specifically, this could mean that caregivers provide support to their partners that they themselves prefer, rather than what they perceive their partners as wanting. The current findings offer some support for this idea as attachment avoidance was found to be negatively associated with the desire for solicitous support (i.e., support seeker avoidance in relation to SSWss) and also with the provision of such support (i.e., caregiver avoidance in relation to SSPcg).

Support provision differs in relation to attachment, with anxiety and avoidance each relating to a different pattern of caregiving. Previous research investigating the influence of attachment anxiety on caregiving behaviours has been mixed. For example, two studies have linked anxiously attached caregiving to negative support provision (e.g., overinvolved, invasive, less responsivity; Collins & Feeney, 2000; Kunce & Shaver, 1994), while another (Feeney & Collins, 2001) found anxiously attached caregivers provided instrumental support in a flexible manner based on the nervousness of their partners. In terms of attachment avoidance, both self-report and observational studies have consistently found it to be negatively associated with the provision of social support (Feeney & Collins, 2001; Fraley & Shaver, 1998; Kunce & Shaver, 1994; Simpson et al., 1992).

Study 1 also investigated the potential influence of attachment characteristics on the provision of pain-related support. Caregiver attachment anxiety was not related to support seeker

(R6a) or caregiver perceptions of solicitous support provided (R6b). The absence of a relationship between caregiver attachment anxiety and solicitous support provided could result from highly anxious caregivers' ability to, at times, provide appropriate levels of solicitous support (Feeney & Collins, 2001). Equally possible is that caregiver attachment anxiety might influence only the quality of support provided rather than the quantity or amount of support.

In contrast to the null findings with caregiver anxiety, there was a consistent pattern of statistically significant findings regarding caregiver attachment avoidance. Relative to caregivers low in avoidance, caregivers higher in attachment avoidance provided less solicitous support. This was found with both support seekers' (H6a) and the caregivers' (H6b) reports of solicitous support provided (i.e., SSPss and SSPcg, respectively). These findings are consistent with the relationships that were hypothesized and with a few other studies that have shown attachment avoidance to be associated with less positive responses to pain, such as negative attitudes towards the display of pain behaviour (McWilliams et al., 2010), less positive evaluations of those in pain (Bailey et al., 2012), and lower levels of solicitous support provided (Bailey et al., 2015; Gauthier et al., 2012).

5.1.2 Study 1 CCM Variables

5.1.2.1 CCM-solicitous support wanted. The CCM posits that individuals high in pain catastrophizing display heightened pain behaviours in an attempt to elicit solicitous support and to ensure their pain is managed interpersonally. Supportive of part of this model, previous research with a sample of chronic pain patients indicated that individuals high in pain catastrophizing reported wanting more solicitous support when experiencing pain than those low in pain catastrophizing (McWilliams et al., 2014). Consistent with what was hypothesized, Study 1 indicated that this relationship was also present amongst those not experiencing chronic pain (H3a). Furthermore, support seeker catastrophizing was positively associated with caregiver reports of SSWcg (H3b), which suggests that the efforts of high catastrophizing support seekers to communicate their desire for solicitous support were effective.

There is no theoretical reason to believe one's pain-support preferences would be influenced by the pain catastrophizing characteristics of ones' partner. As a result, these relationships were treated as open research questions. Thus, the non-significant relationships between caregiver pain catastrophizing and both SSWss (R3a) and SSWcg (R3b) were not unexpected.

5.1.2.2 CCM-solicitous support provided. In contrast to what was found with the variables related to the solicitous support wanted by support seekers, support seeker pain catastrophizing was unrelated to SSPss (H5a) and SSPcg (H5b). The CCM (Sullivan, 2012) posits that high pain catastrophizers want their pain managed in an interpersonal context through the acquisition of social gains. However, the findings of Study 1 did not support the social gains component of the CCM as according to both the support seekers and their partners, support seekers high in pain catastrophizing did not actually receive any more solicitous support than did those low in catastrophizing. It could be that the strategies pain catastrophizers employ frustrate their partners, which, in turn, causes them to resist providing the desired support or to react in a non-solicitous manner. This might explain why previous studies also found a relationship between pain catastrophizing and punishing or critical partner responses (Buenaver et al., 2007; Keefe et al., 2003).

Only one study provided findings relevant to the role of caregiver pain catastrophizing on the provision of solicitous support in romantic relationships (Gauthier et al., 2011). That study found differences in the pain behaviour of chronic pain patients based on their and their partners' levels of pain catastrophizing (i.e., high vs. low). More specifically, high catastrophizing chronic pain patients with low catastrophizing partners displayed more pain behaviours than any other combination of romantic partner level of catastrophizing (e.g., low catastrophizing pain patient-high catastrophizing partner). This pattern of findings raises the possibility that the pain catastrophizing of significant others may play a role in the provision of interpersonal pain-related support.

In Study 1, caregiver pain catastrophizing was positively associated with solicitous support provided when considering SSPss (H7a), but not when considering SSPcg (H7b). This indicates that support seekers report receiving more solicitous support from higher catastrophizing partners, but these partners do not report providing higher amounts of support than the low catastrophizing partners. Several studies have found that the areas of the brain activated during the experience of the pain are similarly activated when pain is witnessed in others (e.g., Botvinick et al., 2005; Jackson, Meltzoff, & Decety, 2005; Jackson, Rainville, & Decety, 2006; Morrison, Lloyd, di Pellegrino, & Roberts, 2004; Saarela et al., 2007). This can also cause the observer's nervous system to react in a similar manner as if the observer was actually experiencing the pain (e.g., Betti & Aglioti, 2016). It has been suggested that this

similarity in brain activation between self-experienced and vicarious pain occurs to allow observers to empathize with the pain experience of others by engaging their affective, cognitive, and sensory systems (Terrighena & Lee, 2017). Relating these findings to Study 1, it might be that the vicarious pain that occurs from observing their partners pain engenders highly catastrophizing caregivers to provide more solicitous support triggered by their own desire to receive increased levels of solicitous support during an episode of pain. Given the relatively limited amount of research investigating the role of the pain catastrophizing of significant others on solicitous support provided in romantic couples during episodes of pain, more research is required to better understand the relationship between these variables.

5.1.3 Single-item Follow-up Questions

The use of difference scores, capturing the discrepancy between the various support variables would have been an intuitively sensible way to examine the data collected. For example, attachment anxiety has a positive association with dissatisfaction with social support, so it might have been theoretically interesting to determine whether attachment anxiety is associated with a larger difference between solicitous support wanted and solicitous support provided scores, which might be related to dissatisfaction with the support provided (Anders & Tucker, 2000; Collins & Feeney, 2004; Priel & Shamai, 1995). However, for a wide range of reasons (e.g., increased probability of both Type 1 and 2 errors, lower reliability than other alternative statistical analyses, serious methodological errors that go beyond issues with low internal consistency) the use of such scores is inappropriate from a statistical perspective (Edwards, 2001). Thus, Study 1 focused on what individuals wanted and received in terms of social support.

To address some of the constructs related to potential differences between the dependent variables, single-item follow-up questions were used. Support seekers rated how satisfied they were with the pain-related support provided to them and their partners' skill in recognizing their pain. The caregivers rated how satisfied they think their partners are with the support provided by them and how difficult or easy they find it to recognize partners' pain. Given the emphasis on communication within attachment theory and the CCM, support seekers were also asked about their comfort asking for help when in pain and caregivers were asked how comfortable they perceive their partners to be asking for help when in pain. No hypotheses were made regarding relationships between the support seeker and caregiver single-item follow-up questions and

either the attachment theory or CCM variables. Relationships between the attachment theory variables and single-item follow-up questions will be discussed first, followed by those pertaining to the CCM variables.

5.1.3.1 Attachment theory-single-item follow-up questions. The attachment variables were unrelated to the support seekers' reports of satisfaction. Several studies have found a negative association between satisfaction with social support and both attachment anxiety and avoidance, so these findings are somewhat surprising (Anders & Tucker, 2000; Collins & Feeney, 2004; Priel & Shamai, 1995). Support seeker avoidance was negatively associated with their reports of how much solicitous support they wanted and how much they received. Given this, it was initially expected that support seeker avoidance would be positively associated with support seeker satisfaction with support. However, it is important to note that the two negative associations involving support seeker avoidance and solicitous support do not indicate that the levels of solicitous support wanted by those high in avoidance matched the level of support they received. Differences between support wanted and received could be responsible for this null finding.

Caregivers' perceptions of partner satisfaction with pain-related support were negatively associated with caregiver attachment anxiety and avoidance. This pattern of findings indicates that caregivers high in both forms of attachment insecurity perceive their partners as being relatively less satisfied with the support they have provided to them than do those low in both forms of insecurity. These results could help explain why highly anxious caregivers have been found to provide overinvolved, invasive, and overwhelming support. Perhaps they are hypervigilant to signs of their partners' dissatisfaction with the support provided and respond by attempting to provide more support. In contrast, avoidantly attached caregivers have been found to provide support that is insensitive, unaccepting, and inaccessible, and to deliver less emotional and physical contact (Kunce & Shaver, 1994). In the current study, avoidantly attached caregivers might have perceived their partners as being relatively less satisfied because they recognized their own reluctance to provide support or their reduced capacity to provide effective support. However, caregiver avoidance was unrelated to support seeker satisfaction with social support. This raises the possibility that the relatively low levels of partner satisfaction perceived by caregivers high in attachment insecurity might be inaccurate. Consistent with this possibility, the support seekers' and caregivers' ratings of satisfaction were unrelated to each other (i.e., r =

.04).

The findings of the single-item follow-up questions revealed a negative association between support seeker attachment avoidance and caregivers' skill in recognizing their partners' pain according to both support seekers and their partners. This means avoidantly attached support seekers view their partners as less skilled in recognizing when they are in pain compared to support seekers low in attachment avoidance and caregivers with highly avoidant partners reported more difficulty knowing when their partner is in pain compared to caregivers with less avoidant partners. Avoidant attachment is characterized by a desire to cope with distressing experiences independently using compulsive self-reliance (Bowlby, 1969; Mikulincer & Shaver, 2003). Therefore, it is likely quite difficult for the partners of avoidantly attached individuals to recognize when they are in pain, as the coping strategies used by avoidantly attached individuals are intrapersonal and not intended to elicit support from those around them.

There are no previous studies investigating reports or perceptions of comfort in asking for pain-related support from either member of a romantic dyad. Highly avoidant support seekers reported themselves as less comfortable asking for help when experiencing pain than those low in avoidance. This might have also been evident to the caregivers, as support seeker avoidance was negatively associated with caregivers' perceptions of their partners' comfort in asking for pain-related support. For similar reasons previously discussed, such as the tendency of avoidantly attached individuals to engage in deactivation, these findings were not unexpected. Avoidantly attached individuals have consistently been found to seek less social support during distressing events and to engage in self-reliant coping that does not involve their attachment figures (Bailey et al., 2015; Collins & Feeney, 2000; Mikulincer & Shaver, 2003; Vogel & Wei, 2005). Therefore, it follows that these individuals might not be particularly comfortable asking for support.

Caregiver avoidance was also negatively associated with caregiver reports of partner comfort in asking for pain-related support. Avoidant caregivers have been found to provide relatively low levels of support (Simpson et al., 1992; Simpson et al., 2002) and attachment avoidance has been associated with both the belief that displays of pain behaviours are intolerable and objectionable (McWilliams et al., 2010) and the belief that individuals experiencing pain are less deserving of support (Bailey et al., 2012). Therefore, it could be that avoidantly attached caregivers are limited in their ability to understand their partners' verbal and

nonverbal communication and emotional expression, which may cause them to perceive their partners as uncomfortable asking for support. Another possibility is that avoidantly attached caregivers view their partners as uncomfortable in asking for support because they perceive themselves as being relatively unresponsive to requests for assistance. This last possibility seems to be a less promising explanation because support seekers with highly avoidant partners did not report themselves as less comfortable asking for help during pain than those with less avoidant partners.

5.1.3.2 CCM-single-item follow-up questions. In the analyses examining associations between PCS scores and the single-item follow-up questions, only one was statistically significant. The positive association between support seeker pain catastrophizing and caregivers' ratings on the comfort variable indicates that high pain catastrophizing support seekers were perceived by their partners as more comfortable asking for support when experiencing pain than were low catastrophizers. This raises the possibility that high catastrophizers are more direct in their communication for pain-related support than the CCM suggests. Perhaps those high in pain catastrophizing engage in both direct and indirect efforts to communicate their pain, and that this pattern of communication leads them to be perceived as comfortable asking for pain-related support. The CCM is focused on non-verbal communication and might be overlooking the efforts of those high in pain catastrophizing to directly ask for assistance. It should also be noted that support seekers high in pain catastrophizing did not report themselves as any more comfortable asking for help during an episode of pain than low catastrophizers, which might reflect a difference between the ability ask for help captured by the caregiver ratings and actual comfort in asking for help that would likely have been more directly assessed with the support seeker ratings.

The overarching purpose of the program of research was to directly compare the strengths of relationships between the pain-related interpersonal support variables and both attachment theory and the CCM in non-clinical and clinical samples. These comparisons for Study 1 are presented in a subsequent section along with those from Study 2.

5.2 Study 2 Discussion

Study 2 compared the strengths of the relationships between variables relevant to both attachment theory (i.e., attachment anxiety and avoidant) and the CCM (i.e., pain catastrophizing) and two pain-related variables (i.e., solicitous support wanted and received)

thought to play a role in both the development and maintenance of chronic pain in a clinical sample. In addition, this study was designed to investigate whether these relationships were moderated by pain duration. Study 2 was intended to complement Study 1 by examining some of the same relationships in the context of chronic pain. Only the chronic pain patients (i.e., support seekers) completed the questionnaires. Therefore, caregivers' perspectives were not included in the analyses and will not be discussed in the following section. Since the hypotheses for Study 2 were based on the same literature as Study 1, the following sections have been focused on comparing the pattern of findings between the two studies.

5.2.1 Study 2 Attachment Theory Variables

5.2.1.1 Attachment theory-solicitous support wanted. When considering the attachment variables and solicitous support wanted, the pattern of findings was identical to what was found with the support seeker variables in Study 1. Neither study found a relationship between support seeker attachment anxiety and solicitous support wanted. This is inconsistent with what was hypothesized (H8) on the basis of Bailey et al.'s (2015) finding and attachment theory. It was expected that the hyperactivating secondary attachment strategy of anxious individuals would involve, or be related to, a desire for solicitous support. The support for this idea is weak (i.e., only Bailey et al.'s findings). However, it remains possible that attachment anxiety might be related to the desire for other extreme forms of pain-related social support (e.g., constant proximity, continuous companionship, persistent encouragement and reassurance) or to ambivalence about pain-related support. In contrast to the null findings regarding anxiety, both the study with a non-clinical sample and the study with a clinical sample encompassed within the current program of research, and Bailey et al. found attachment avoidance was negatively associated with the SSW (H9). Thus, there is consistent evidence that those high in attachment avoidance want less solicitous support than those low in attachment avoidance.

5.2.1.2 Attachment theory-solicitous support provided. Based on past research (Bailey et al., 2015), a negative association was hypothesized between anxiety and solicitous support provided (H11), while the relationship between attachment avoidance and solicitous support provided was left as an open research question (R7). A consistent pattern of findings was shown for support seeker attachment and support seeker reports of solicitous support provided across Study 1 and 2. In terms of anxiety, neither Study 1 nor Study 2 found a relationship between it and solicitous support provided. It is important to note that this is consistent with at least two

other studies (Forsythe et al., 2012; Gauthier et al., 2012) with clinical samples that did not find an association between attachment anxiety and perceptions of solicitous support received. In contrast to these null findings, attachment avoidance was negatively associated with solicitous support provided in both Study 1 and 2.

5.2.2 Study 2 CCM Variables

5.2.2.1 CCM-solicitous support wanted. Sullivan and colleagues (2001) proposed that the function of high pain catastrophizers' heightened displays of pain behaviour were to ensure that their pain was managed in an interpersonal context. Based on this, it was hypothesized that pain catastrophizing would be positively associated with solicitous support wanted. However, support seeker pain catastrophizing was unrelated to solicitous support wanted (H10). This pattern of findings differed from Study 1, as these two variables were positively associated in the non-clinical sample. Thus, amongst those not experiencing chronic pain, high catastrophizers appear to desire solicitous support, but this relationship was not found in the context of chronic pain. Sullivan (2012) suggested that high catastrophizers' use of a communal coping style during acute episodes of pain potentially results in those individuals receiving the support and interpersonal benefits they desire. However, he stated that long-term use of the communal coping style might result in an exhaustion of interpersonal support, which could engender punishing or anger responses in response to displays of pain behaviours. Alternatively, over time high catastrophizers experiencing chronic pain might, for one reason or another, prefer other forms of pain-related support instead. As previously noted, one study found that chronic pain patients reported wanting less solicitous support (Newton-John & Williams, 2006). It could be that over time, high catastrophizers do not find solicitous support beneficial and would rather receive interpersonal pain-related support that directly addresses their catastrophic cognitions (e.g., helping them stop ruminating or helping them alter their perceptions of helplessness) or distracts them from their pain.

5.2.2.2 CCM-solicitous support provided. Based on past research, a negative association between pain catastrophizing and SSP was hypothesized (H12; Boothby et al., 2004; Keefe et al., 2003). This hypothesis was supported. It could be that the CCM is more directly applicable to experiences of acute pain, rather than chronic pain. However, the findings with the non-clinical sample included in Study 1 also did not find a relationship between these two variables, which should be considered as inconsistent with the CCM. It can be argued that this

negative association is actually consistent with the CCM. Sullivan (2012) suggested that the repeated use of a communal coping style to obtain pain-related support has the potential to elicit critical or punishing responses from significant others during longer-term pain. Two studies provided partial support for this idea. One study found a positive association between pain catastrophizing and solicitous support received that was attenuated amongst those with longer compared to shorter pain durations (Buenaver et al., 2007). Another study also found a positive association between these two variables for a shorter pain duration (Cano, 2004). However, this association was not present for the longer pain duration. Perhaps over time, high catastrophizers experiencing longer-term pain actually receive less solicitous support or become accustomed to the amount of support provided and perceive themselves as receiving less.

5.2.2.3 Pain duration. Research has shown pain duration to be a moderator of the relationship between pain catastrophizing and perceptions of solicitous support provided in studies with chronic pain samples. One study found a positive association between pain catastrophizing and perceptions of solicitous support provided for those with shorter pain durations, but not for those with longer pain durations (Cano, 2004). Another study found the strength of the relationship between the two variables decreased for individuals with longer pain durations (Buenaver et al., 2007). Given the mixed findings, this potential interaction effect between pain duration and pain catastrophizing on SSP was investigated as an open research question (R8). Pain duration did not moderate the relationship between pain catastrophizing and SSP.

While there were no other specific hypotheses or research questions regarding pain duration, it was examined as a potential moderator of the other relationships studied. There were no significant two-way interactions involving pain duration. However, a three-way interaction was revealed involving attachment anxiety, attachment avoidance, and pain duration associated with perceptions of solicitous support provided. The overall pattern of findings indicated that: (a) there was a large negative association between attachment avoidance and perceptions of solicitous support (β = -.51), and (b) this association was relatively weaker (i.e., only marginally significant) amongst those with a short pain duration and a low level of attachment anxiety. Thus, there was a very inconsistent pattern regarding the influence of pain duration on the other relationships studied. Given the considerable number of interaction effects tested, this three-way interaction might represent a Type I error.

5.2.3 Study 1 and 2 Comparing Attachment Theory to the CCM

The overarching purpose of Study 1 and 2 was to directly compare variables relevant to attachment theory (i.e., attachment anxiety and avoidance) and the CCM (i.e., pain catastrophizing) in terms of the strengths of their relationships with interpersonal pain-related support variables (i.e., solicitous support wanted and received) thought to be to the development and maintenance of chronic pain. Comparisons in Study 1 were conducted in relation to both the main and follow-up analyses. Four variables related to solicitous support (i.e., SSWss, SSWcg, SSPss, and SSPcg) were included in the main analyses of Study 1. The follow-up analyses included three single item variables for each member of the couples (i.e., six in total). Study 2 included only support seekers' perspectives and did not include single-item follow-up ratings. Therefore, Study 2 comparisons were only conducted in relation to two variables, SSW and SSP. Both studies used the same two criteria to determine which framework better predicted the dependent variables. First, if one model produced statistically significant findings and the other did not, the former would be considered a stronger approach for that dependent variable. Second, if both models produced statistically significant findings, effects sizes based on Cohen's (1992) correlation effect sizes adapted for use with regression effect sizes (i.e., small $R^2 \geq .01$; medium $R^2 \geq .09$; large $R^2 \geq .25$) were compared. A difference equivalent to a moderate effect size was required to determine one set of variables as a stronger predictor of the specific pain-related variables than another.

Attachment theory (Bowlby, 1969) is an interpersonally-based framework that has been used to investigate numerous social processes (e.g., bullying interactions, dispositional gratitude, employee satisfaction and burnout, and social self-efficacy and self-disclosure; Nickerson, Mele, & Princiotta, 2008; Ronen & Mikulincer, 2012; Wei, Russell, & Zakalik, 2005; Zhang, Zhang, Yang, & Li, 2017). Only recently has attachment theory been applied to investigating the interpersonal aspects of pain (e.g., empathy, self-perceived burden, social exclusion; Frías & Shaver, 2014; Hurter et al., 2014; Kowal et al., 2012). Conversely, pain catastrophizing has been extensively studied in the area of pain. Given that attachment theory is an interpersonal framework proposed to account for social processes and the CCM emerged from a cognitive-behavioural framework, it was expected that attachment theory and the corresponding interpersonal variables (i.e., attachment anxiety and avoidance) would have the strongest relationships with the interpersonal pain-related variables included in Study 1 and Study 2.

In Study 1, in all four comparisons involving the solicitous support variables, the attachment theory variables were more strongly related to the interpersonal pain-related support variables than the catastrophizing variables. Regarding the single-item follow-up questions associated with Study 1, there were six comparisons between attachment theory and the CCM. Of those six, attachment was a stronger predictor of four of them, which included: support seeker reports of partners' skill in recognizing support seeker pain, caregiver reports of ease in recognizing partners' pain, caregiver perception of partners' satisfaction with support provided, and support seeker reports of comfort asking for support. Attachment theory and the CCM were deemed equal in the strengths of their relationships with the other two dependent variables (i.e., support seeker reports of satisfaction with support and caregiver reports of support seeker comfort requesting support). In terms of support seeker reports of satisfaction, neither model was significant. This differed from caregivers' perception of comfort, where both models were significant, but there was not a moderate effect size difference between them.

In the clinical sample utilized in Study 2, both comparisons revealed that the attachment variables outperformed the pain catastrophizing. Across both studies, there were twelve comparisons between attachment theory and the CCM. In ten cases, the attachment theory variables were better able to account for variance in the dependent variables, and in two cases both frameworks were considered equal in their ability to account for the interpersonal pain-related variables. These findings indicate that attachment outperformed the CCM in 83% of the comparisons, and in the other 17% of instances performed on par with the CCM. There was not a single comparison in which the CCM variables were more strongly related to the dependent variables.

Craig's (2009, 2015) social communication model of pain suggests that the intrapersonal and interpersonal factors of both individuals experiencing pain and those observing the individuals in pain are relevant to the experience of pain and the provision of support. The findings of the present study can be viewed within the social communication model, and they indicate that intrapersonal variables related to both attachment theory and to the CCM are related to the provision of pain-related social support. This is true of both characteristics of those with pain (i.e., support seekers) and those observing pain (i.e., caregivers). Additional research is required to determine how these characteristics influence interpersonal processes during the experience of pain and the provision of pain-related support. The sex of both the individuals

experiencing pain and the observers is also included within the social communication model of pain (Hadjistavropoulos et al., 2011). The main findings regarding support seeker sex are reported in the following section. In general, the sex differences in the dependent variables suggest that the sex of both support seekers and caregivers has an important influence on pain-related support preferences and on the provision of pain-related support.

5.3 Sex Differences

Sex differences have been found in the literature relating to social support, pain and pain catastrophizing, which are the topics most relevant the current program of research. As a result of their prominence in these areas of study, sex differences were also examined in the main and follow-up analyses of the present study. However, given that sex differences were not the focus of the program of research, the discussion will primarily focus on the statistically significant findings.

5.3.1 Sex Differences in Social Support

Consistent with past research, support seeker sex was positively associated with reports of solicitous support wanted in both the non-clinical and clinical samples (Manne et al., 1999; McWilliams et al., 2012). These findings indicate that females want higher amounts of solicitous support than males.

Caregivers' reports of solicitous support provided were negatively associated with support seeker sex in the non-clinical sample. Given that this finding emerged within male-female dyads and the support seeker sex variable also reflects the sex of the caregiver, this finding indicates that male caregivers reported providing less solicitous support than female caregivers. This finding is in line with past research that has consistently found women typically provide more social support than men (e.g., Shumaker & Hill, 1991).

In terms of the six single-item questions, only one was found to be associated with support seeker sex. Female support seekers were more likely than males to be perceived as comfortable asking for help when experiencing pain. This corresponds with numerous studies that found females are more likely than males to seek social support when experiencing a stressor (Ashton & Fuehrer, 1993; Burda et al., 1984; Reevy & Maslach, 2001; Tamres et al., 2002).

5.3.2 Sex Differences in Pain, Disability, and Pain Catastrophizing.

Numerous clinical and experimental studies have shown sex differences in the experience

of pain and pain-related variables, such as disability and pain catastrophizing. Study 1 included sex and pain catastrophizing (see for review Bartley & Fillingim, 2013; Fillingim, 2000; Fillingim, King, Ribeiro-Dasilva, Rahim-Williams, & Riley, 2009). Consistent with past research with non-clinical samples, females reported higher pain catastrophizing than did men. Study 2 included pain severity, disability, and catastrophizing (Edwards et al., 2004; Forsythe et al., 2011; Sullivan et al., 1995; Sullivan et al., 2000). Of the three variables, only disability was significantly related to support seeker sex, with females reporting higher ratings of disability than males. This finding regarding disability is consistent with past studies (Keefe et al., 2000; Stubbs et al., 2010). Keefe and colleagues (2000) suggested a link between biological sex and pain catastrophizing and theorized that females experience more disability because they have been found more likely to engage in pain catastrophizing. This model was not supported by the current findings, as support seeker sex was unrelated to catastrophizing in the chronic pain sample. The absence of a relationship between support seeker sex and pain catastrophizing in the chronic pain sample was surprising, as several studies with chronic pain patients found females to report higher levels of pain catastrophizing compared to men (e.g., Jensen et al., 1994; Keefe et al., 2000).

5.3.3 Sex Differences in Attachment

Research examining sex differences in attachment has generally found that males are more likely to be characterized by high attachment avoidance, while females are more likely to be high in attachment anxiety (Del Giudice, 2011; Mickelson et al., 1997; Shaver et al., 1996). However, at least one study has not found any sex differences in attachment (Shaver & Hazan, 1993). Consistent with past research, a positive association was found between support seeker sex and caregiver attachment avoidance in Study 1. This finding suggests that males are more likely than females to be avoidantly attached in a non-clinical sample. No other statistically significant sex differences emerged with regard to attachment in either Study 1 or Study 2.

5.4 Implications

5.4.1 Research Implications

Attachment avoidance was consistently related to a relatively lower level of interest in receiving solicitous support and to receiving relatively less of this type of support. Previous research has found that those with attachment avoidance hold negative beliefs regarding displays of pain behaviours (McWilliams et al., 2010) and towards individuals experiencing pain (Bailey

et al., 2012). These studies have focused on avoidantly attached individuals' beliefs of others experiencing pain and not on themselves requesting pain-related support. The current single-item follow-up questions provided some insight regarding this topic. Relatively avoidant individuals reported experiencing discomfort asking for pain-related support. They were also perceived this way by their partners. However, the reason these individuals experience discomfort asking for pain-related support remains poorly understood. More research is required to determine what avoidantly attached individuals find discomforting and potentially aversive about requesting support while experiencing pain.

Given that anxiously attached individuals utilize hyperactivation strategies to obtain support and regulate affect, it was thought that these attention- and support-seeking behaviours would be reflected in associations between support seeker anxiety and the dependent variables. However, the hypothesized relationships between attachment anxiety and solicitous support wanted and provided were mostly unsupported. Given past research related to pain (Bailey et al., 2015) and attachment in general (Mikulincer & Shaver, 2003, 2016), it is premature to abandon that idea. However, this could be a very complex issue as anxiety involves an ambivalent desire for support involving a fear of rejection and uncertainty of available support that prevents attempts to directly communicate a desire for support (Mikulincer & Shaver, 2003). Perhaps individuals characterized by anxious attachment indirectly communicate a desire for support through displays of pain behaviours, while also demonstrating a reluctance to seek support by not stating or acknowledging the type of support they truly desire. Several other studies (MacDonald, Locke, Spielmann, & Joel, 2012; Mikulincer, Shaver, Bar-On, & Ein-Dor, 2010) have found that anxiously attached individuals experience ambivalence relating to a variety of social factors occurring in close relationships (e.g., social threat and reward, relational closeness, and attitude towards partner) and at least one study (Vogel & Wei, 2005) found that attachment anxiety can result in the desire for both more and less social support.

In general, research that incorporates laboratory pain tasks and observations of pain behaviours has great potential to increase understanding of the ambivalence of individuals with attachment anxiety, and identify factors that may reduce ambivalence (e.g., experimentally manipulated higher levels of pain or threat appraisal) or increase it (e.g., fear or rejection or uncertainty regarding the availability of support). Perhaps regardless of social context anxiously attached individuals inhibit the expression of pain-related discomfort as a result of their

ambivalence. However, these same individuals might overcome their fear of rejection or concerns about the unavailability of support in a high threat condition due to their overwhelming distress. Research studies of this nature have the potential to provide a clearer picture of what circumstances contribute to ambivalence regarding help-seeking experienced by those with high attachment anxiety.

In the current program of research, pain catastrophizing was positively related to what non-clinical participants want for interpersonal pain-related support, but unrelated to solicitous support received in Study 1 and negatively associated with this variable in Study 2. Therefore, the tenets of the CCM were not wholly supported. However, high catastrophizers might be providing the support that they desire to others. This is illustrated by the findings that support seeker pain catastrophizing was related to solicitous support wanted and that caregivers high in pain catastrophizing were reported by their partners as providing more solicitous support than caregivers low in pain catastrophizing. The observation of others experiencing pain appears to trigger patterns of brain activation that are similar to those occurring in those being observed while in pain (Botvinick et al., 2005; Jackson et al., 2005; Jackson et al., 2006; Morrison et al., 2004; Saarela et al., 2007). Therefore, it is possible that when individuals high in pain catastrophizing witness pain in their partners, their empathic neural response prompts them to provide the social support that they themselves desire.

Severeijns, Vlaeyen, and van den Hout (2004) suggested that pain catastrophizing is an intrapersonal cognitive appraisal variable that was incorrectly defined an interpersonal variable. They argued that the social aspects result from the inherent nature of the appraisal process. That is, high pain catastrophizers evaluate themselves as unable to cope with real or anticipated pain and engage in rumination, magnification, and feelings of helplessness, which results in overt displays of distress and pain behaviours. These displays naturally engender attention, but that this attention is merely a biproduct of the intrapersonal appraisal process. Severeijns et al.'s (2004) non-social conceptualization of catastrophizing is much more similar to the way catastrophizing is viewed in the literature on psychopathology, which considers it a type of cognitive distortion rather than a means of eliciting interpersonal support (see Gellatly & Beck, 2016). A recent study explored the idea of pain catastrophizing as a cognitive construct rather than an interpersonal variable (Vlaeyen et al., 2009). The authors compared the CCM and cognitive appraisal model by examining displays of pain behaviour in relation to social context

and perceived threat in a non-clinical sample of undergraduate university students. Participants underwent a CPT where social context (i.e., observer present or absent) and perceived threat (i.e., either high or low) was manipulated. Interestingly, neither model was supported. High catastrophizers were not found to display higher levels of pain behaviours in either the social context or perceived threat conditions. However, the study did find that high pain catastrophizers used more pain expression regardless of social context compared to low catastrophizers. This does not support the CCM, as the model posits that high catastrophizers display more pain behaviour in the presence of others to elicit support. The finding that neither the communal coping nor the cognitive appraisal models were supported raises the possibility that another more fundamental variable could give rise to both the internal experience of pain catastrophizing captured by the PCS and outward expressions of pain regardless of social situation.

Attachment anxiety may be the fundamental variable responsible for the tendency of those high in catastrophizing to engage in more pain behaviours than those low in pain catastrophizing. This is a plausible hypothesis as anxiety and pain catastrophizing are often found to be highly correlated and were positively associated in all three cases in the current program of research (i.e., Study 1 support seeker variables, Study 1 caregiver variables, and Study 2 variables; McWilliams & Homberg, 2010; Meredith et al., 2006b; Wilson & Ruben, 2011). Moreover, according to theory (i.e., attachment theory and the CCM) attachment anxiety and pain catastrophizing both involve a desire for proximity with caregivers and exaggerated displays of distress aimed at eliciting support. To consider this possibility and potentially integrate the two theoretical frameworks, variables from both models (i.e., attachment anxiety and avoidance, and pain catastrophizing) were compared in terms of the strengths and directions of their relationships with the pain support variables central to the current program of research. Comparisons between the attachment theory and CCM variables did not indicate similar relationships with the dependent variables, which is inconsistent with the idea that attachment anxiety gives rise to pain catastrophizing and other pain-related behaviours and constructs. Further research aimed clarifying the nature of the relationships between attachment variables and pain catastrophizing as well as their shared and unique influences on pain-related behaviours and outcomes is warranted.

5.4.2 Clinical Implications

Several studies (Ciechanowski et al., 2003; Kowal et al., 2015; Meredith et al., 2007) and

information created for health care providers (Hunter & Maunder, 2016) have emphasized the important influence of the patients' attachment characteristics in the treatment of pain. However, the extent that healthcare professionals consider the attachment of the individuals that they treat remains unclear. The frequent refrain of a need for the development or use of attachment-informed approaches for the treatment of pain suggests it is not widespread practice (Andrews et al., 2011; Mikail et al., 1994; Meredith, 2016: Meredith et al., 2008; Porter et al., 2007). Consideration of partners' attachment in pain treatment is even less common (Romeo, Tesio, Castelnuovo, & Castelli, 2017). However, there are numerous ways that the attachment style of either partner could interfere with the successful achievement of pain treatment goals.

Treatments for chronic pain are focused on helping individuals resume their regular daily activities (e.g., employment, leisure, and home-related), decrease pain behaviours and increase well behaviours, and learn strategies to decrease stress and manage negative emotions. Support seeker attachment avoidance was negatively associated with wanting and receiving solicitous support, which suggests that when avoidantly attached individuals are experiencing pain their preference is to deal with it on their own and not involve others. As well, the findings with the follow-up questions indicated that support seeker avoidance was negatively associated with the two variables reflecting caregivers' level of difficulty recognizing support seekers' pain, and with the two variables reflecting support seekers' level of comfort in seeking pain-related support. Thus, it appears that avoidant individuals are relatively successful in avoiding a form of pain-related support they do not want (i.e., solicitous support) and that they might have difficulty obtaining forms of support they would find desirable. Rehabilitation requires fairly significant changes in how one reacts to pain (e.g., discussing pain and pain symptoms in an open and honest manner, admitting physical limitations and expressing the need for support, involving others and discarding the use of self-reliant coping, attending to and following through with healthcare professionals treatment recommendations) and generally requires some support and collaboration with a partner (e.g., helping with or encouraging recommended exercises or activities, discussing employment, attending healthcare appointments). Avoidantly attached individuals may struggle in such rehabilitative efforts because of their discomfort with relational and emotional closeness.

Avoidantly attached caregivers reportedly provided less solicitous support according to both themselves and their partners. Given that pain treatment requires support and collaboration

from both partners, again those with avoidant attachment would also likely struggle, even as partners of individuals with chronic pain, because of their discomfort with closeness and intimacy. These individuals are likely less to provide the necessary support to their partners, so they might require extra help to engage with their partners. Supportive of this idea, the findings of the current program of research indicated that avoidantly attached caregivers reported their partners as less comfortable asking them for support when in pain.

This program of research focused on self-reports of solicitous support. However, there are many other interpersonal variables, such as pain behaviour or self-perceived burden, which may also be related to attachment. Studies of these variables might also contribute to treatment innovation. Kowal and colleagues (2012) found a positive association between attachment anxiety and self-perceived burden in a chronic pain sample. Moreover, they found that the relationship between the two variables was moderated by attachment avoidance, where higher avoidance was related to less burden. These findings have several implications regarding the treatment of pain. Anxiously attached individuals experiencing high self-perceived burden may refrain from openly and accurately describing their pain or pain symptoms for fear of overburdening their partners. However, these individuals may also be more demanding of their partners and contribute to their feelings of burden. This in turn, could exhaust caregivers and result in them providing punishing or dismissive responses to their partners. Taken together, the findings of the current program of research and past studies suggest that interpersonal factors, such as the attachment of both members of a romantic dyad, self-perceived burden, and pain behaviours, are relevant and have clinical application to the development and delivery of pain treatment.

5.5 Limitations

It is important to acknowledge the limitations in the current program of research. Self-report measures were the only data collection tools employed. These measures have several advantages, which include allowing for the timely collection of data from a large sample (Hoskin, 2012) and gathering information about participants' inner states (Schwarz, 2007). However, there are disadvantages inherent to their use. These disadvantages include vulnerability to respondents' inattention, various forms of self-response bias (e.g., socially desirable responding), and misunderstanding of the questions (Hoskin, 2012; Schwarz, 2007).

However, the majority of the self-report measures used have been well-validated and rigorous data screening methods were used in the current research.

Another limitation of the present research relates to asking participants to recall instances where they experienced pain. Recalling a pain experience is different from actually experiencing pain in the moment. Therefore, the reports on pain-related support might not trigger the same responses as those obtained relative to the actual experience of pain. One study compared daily diary and retrospective reports of pain in a clinical sample of children and youth (Lewandowski, Palermo, Kirchner, & Drotar, 2009). The authors found that retrospective reports of pain were significantly higher than the daily reports. Although Lewandowski et al. (2009) used a younger sample and did not ask about support, their findings highlight the differences that can occur between diary and retrospective reports regarding experiences with pain.

Same-sex couples were not included in the analyses to ensure the sample was as homogenous as possible. This is a limitation of the current program of research. Presently there is a dearth of studies investigating whether the preference for and provision of pain-related support in same-sex romantic couples differs in any meaningful way from heterosexual couples. Therefore, future research should focus on this topic area to help inform researchers and to contribute to the literature on the interpersonal aspects of chronic pain in romantic couples.

Lastly, the absence of caregiver reports in Study 2 was a limitation. Several studies including the current program of research have shown that self-reports obtained from each member of a dyad are not perfectly related (Junghaenel, Schneider, & Broderick, 2017; Lousberg et al., 1992; Sharp & Nicholas, 2000). Junghaenel and colleagues noted this absence of a perfect relationship between such variables and suggested that both members of the dyad provide unique information. Similarly, it would be appropriate to view the support seekers and caregivers in Study 1 as providing unique information. As the social communication model of pain (Craig, 2009, 2015) emphasizes, the intrapersonal and interpersonal factors of both the individuals experiencing pain and those observing individuals experiencing pain are involved in the experience and communication of pain. Therefore, the information provided by both parties provides a richer understanding of the desire for and provision of interpersonal pain-related support. However, even without the caregiver's reports in Study 2, this program of research has the potential to uniquely contribute to the literature by: (a) providing a broader understanding of the relationships between interpersonal pain-related support and both attachment theory and the

CCM in both non-clinical and clinical samples and (b) identifying several new avenues of research within the broader literature of interpersonal factors involved in pain-related support.

5.6 Conclusion

The findings of previous research and the current program of research suggest that attachment anxiety, attachment avoidance, and pain catastrophizing are intrapersonal characteristics that are relevant for understanding pain-related communication and social support processes. This program of research aimed to compare the strengths of relationships between several interpersonal variables (i.e., solicitous support wanted and the provision of such support) related to the development and maintenance of chronic pain and variables relevant to both attachment theory (i.e., attachment anxiety and avoidance) and the CCM (i.e., pain catastrophizing). This was done in both a non-clinical sample and a sample of chronic pain patients in order to explore the pattern of findings prior to and after the development of chronic pain. Twelve comparisons were made, and in the majority of cases (87%) attachment variables were more strongly related to the interpersonal pain-related variables than were the CCM variable(s). In the other 13% of cases, attachment and the CCM variable(s) were deemed equal. There were no instances where the CCM variable(s) outperformed attachment. Thus, attachment theory appears to be the more promising theoretical framework for investigating interpersonal processes relevant to the development and experience of chronic pain.

References

Altman, N., & Krzywinski, M. (2016). Points of Significance: Analyzing outliers: Influential or nuisance? *Nature Methods, 13*, 281-282.

Anders, S. L., & Tucker, J. S. (2000). Adult attachment style, interpersonal communication competence, and social support. *Personal Relationships, 7*, 379-389.

Andersen, T. E. (2012). Does attachment insecurity affect the outcomes of a multidisciplinary pain management program? The association between attachment insecurity, pain, disability, distress, and the use of opioids. *Social Science & Medicine, 74*, 1461-1468.

Andrews, N. E., Meredith, P. J., & Strong, J. (2011). Adult attachment and reports of pain in experimentally-induced pain. *European Journal of Pain, 15*, 523-530.

Ashton, W. A., & Fuehrer, A. (1993). Effects of gender and gender role identification of participant and type of social support resource on support seeking. *Sex Roles, 28*, 461-476.

Bailey, J. S., McWilliams, L. A., & Dick, B. D. (2012). Expanding the social communication model of pain: Are adult attachment characteristics associated with observers' pain-related evaluations? *Rehabilitative Psychology, 57*, 27-34.

Bailey, K. M., McWilliams, L. A., Holmberg, D., & Hobson, K. (2015). Wanting and providing solicitous pain-related support: The roles of both relationship partners' attachment styles. *Canadian Journal of Behavioural Science, 47*, 272-281.

Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology, 61*, 226-244.

Bartley, E. J., & Fillingim, R. B. (2013). Sex differences in pain: A brief review of clinical and experimental findings. *British Journal of Anaesthesia, 111*, 52-58.

Beck, A. T., & Haigh, E. A. P. (2014). Advances in cognitive theory and therapy: The generic cognitive model. *Annual Review of Clinical Psychology, 10*, 1-24.

Betti, V., & Aglioti, S. A. (2016). Dynamic construction of the neural networks underpinning empathy for pain. *Neuroscience and Biobehavioral Reviews, 63*, 191-206.

Block, A. R., Kremer, E. F., & Gaylor, M. (1980). Behavioural treatment of chronic pain: The spouse as a discriminative cue for pain behaviour. *Pain, 9*, 243-252.

Boothby, J. L., Thorn, B. E., Overduin, L. Y., & Ward, L. C. (2004). Catastrophizing and perceived partner responses to pain. *Pain, 109*, 500-507.

Botvinick, M., Jha, A. P., Bylsma, L. M., Fabian, S. A., Solomon, P. E., & Prkachin, K. M. (2005). Viewing facial expressions of pain engages cortical areas involved in the direct experience of pain. *NeuroImage, 25*, 312-319.

Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment.* London: Penguin Books.

Breivik, H., Collett, B., Ventafridda, V., Cohen, R., & Gallacher, D. (2006). Survey of chronic pain in Europe: Prevalence, impact on daily life, and treatment. *European Journal of Pain, 10*, 287-333.

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46-76). New York, NY: Guilford Press.

Buenaver, L. F., Edwards, R. R., & Haythornthwaite, J. A. (2007). Pain-related catastrophizing and perceived social responses: Inter-relationships in the context of chronic pain. *Pain, 127*, 234-242.

Burda, P. C., Jr., Vaux, A., & Schill, T. (1984). Social support resources: Variation across sex and sex role. *Personality and Social Psychology Bulletin, 10*, 119-126.

Burns, J. W., Johnson, B. J., Mahoney, N., Devine, J., & Pawl, R. (1996). Anger management style, hostility and spouse responses: Gender differences in predictors of adjustment among chronic pain patients. *Pain, 64*, 445-453.

Burns, J. W., Peterson, K. M., Smith, D. A., Keefe, F. J., Porter, L. S., Schuster, E., & Kinner, E. (2013). Temporal associations between spouse criticism/hostility and pain among patients with chronic pain: A within-couple daily diary study. *Pain, 154*, 2715-2721.

Cabrera-Perona, V., Buunk, A. P., Terol-Cantero, M. C., Quiles-Marcos, Y., & Martín-Aragón, M. (2017). Social comparison processes and catastrophising in fibromyalgia: A path analysis. *Psychology & Health, 32*, 745-764.

Cameron, J. J., Finnegan, H., & Morry, M. M. (2012). Orthogonal dreams in an oblique world: A meta-analysis of the association between attachment anxiety and avoidance. *Journal of Research in Personality, 46*, 472-476.

Campbell, P., Jordan, K. P., & Dunn, K. M. (2012). The role of relationship quality and perceived partner responses with pain and disability in those with back pain. *Pain Medicine, 13*, 204-214.

Cano, A. (2004). Pain catastrophizing and social support in married individuals with chronic pain: The moderating role of pain duration. *Pain, 110*, 656-664.

Cano, A., Barterian, J. A., & Heller, J. B. (2008). Empathic and nonempathic interaction in chronic pain couples. *Clinical Journal of Pain, 24*, 678-684.

Cano, A., Gillis, M., Heinz, W., Geisser, M., & Foran, H. (2004). Marital functioning, chronic pain, and psychological distress. *Pain, 107*, 99-106.

Cano, A., & Williams, A. C. (2010). Social interaction in pain: Reinforcing pain behaviors or building intimacy? *Pain, 149*, 9-11.

Cano, A., Weisberg, J. N., & Gallagher, R. M. (2000). Marital satisfaction and pain severity mediate the association between negative spouse responses to pain and depressive symptoms in a chronic pain patient sample. *Pain Medicine, 1*, 35-43.

Carnelley, K. B., Pietromonaco, P. R., & Jaffe, K. (1996). Attachment, caregiving, and relationship functioning in couples: Effects of self and partner. *Personal Relationships, 3*, 257-277.

Ciechanowski, P., Sullivan, M., Jensen, M., Romano, J., & Summers, H. (2003). The relationship of attachment style to depression, catastrophizing and health care utilization in patients with chronic pain. *Pain, 104*, 627-637.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155-159.

Collins, N. L., & Feeney, B. C. (2000). A safe haven: An attachment theory perspective on support seeking and caregiving in intimate relationships. *Journal of Personality and Social Psychology, 78*, 1053-1073.

Collins, N. L., & Feeney, B. C. (2004). Working models of attachment shape perceptions of social support: Evidence from experimental and observational studies. *Journal of Personality and Social Psychology, 87*, 363-383.

Cook, R. D., & Weisberg, S. (1982). *Residuals and influence in regression.* New York, NY: Chapman & Hall.

Craig, K. D. (2009). The social communication model of pain. *Canadian Psychology, 50*, 22-32.

Craig, K. D. (2015). Social communication model of pain. *Pain, 156*, 1198-1199.

Craig, K. D., Versloot, J., Goubert, L., Vervoort, T., & Crombez, G. (2010). Perceiving pain in others: Automatic and controlled mechanisms. *The Journal of Pain, 11*, 101-108.

Davies, K. A., Macfarlane, G. J., McBeth, J., Morriss, R., & Dickens, C. (2009). Insecure attachment style is associated with chronic widespread pain. *Pain, 143,* 200-205.

Davila, J., & Kashy, D. A. (2009). Secure base processes in couples: Daily associations between support experiences and attachment security. *Journal of Family Psychology, 23,* 76-88.

Del Giudice, M. (2011). Sex differences in romantic attachment: A meta-analysis. *Personality and Social Psychology Bulletin, 37,* 193-214.

Diamond, M. (2002). Sex and gender are different: Sexual identity and gender identity are different. *Clinical Child Psychology & Psychiatry, 7,* 320-334.

Dong, Y., & Peng, C-Y. J. (2013). Principled missing data methods for researchers. *Springer Plus, 2,* 222.

Edwards, J. R. (2001). Ten difference score myths. *Organizational Research Methods, 4,* 265-287.

Edwards, R. R., Cahalan, C., Mensing, G., Smith, M., & Haythornthwaite, J. A. (2011). Pain, catastrophizing, and depression in the rheumatic diseases. *Nature Reviews Rheumatology, 7,* 216-224.

Edwards, R. R., Haythornthwaite, J. A., Sullivan, M. J., & Fillingim, R. B. (2004). Catastrophizing as a mediator of sex differences in pain: Differential effects for daily pain versus laboratory-induced pain. *Pain, 111,* 335-341.

Eisenberger, N. I., Jarcho, J. M., Lieberman, M. D., & Naliboff, B. D. (2006). An experimental study of shared sensitivity to physical pain and social rejection. *Pain, 126,* 132-138.

Feeney, B. C., & Collins, N. L. (2001). Predictors of caregiving in adult intimate relationships: An attachment theoretical perspective. *Journal of Personality and Social Psychology, 80,* 972-994.

Feeney, B. C., Collins, N. L., Van Vleet, M., & Tomlinson, J. M. (2013). Motivations for providing a secure base: Links with attachment orientation and secure base support behaviour. *Attachment & Human Development, 15,* 261-280.

Feeney, B. C., & Thrush, R. L. (2010). Relationship influences on exploration in adulthood: The characteristics and function of a secure base. *Journal of Personality and Social Psychology, 98,* 57-76.

Feeney, J. A. (1996). Attachment, caregiving, and marital satisfaction. *Personal Relationships, 3,* 401-416.

Feeney, J. A., & Hohaus, L. (2001). Attachment and spousal caregiving. *Personal Relationships, 8,* 21-39.

Field, A. P. (2009). *Discovering statistics using SPSS: (and sex and drugs and rock 'n' roll)* (3rd ed.). Thousand Oaks, California: SAGE Publications.

Fillingim, R. B. (2000). Sex, gender, and pain: Women and men really are different. *Current Review of Pain, 4,* 24-30.

Fillingim, R. B., Doleys, D. M., Edwards, R. R., & Lowery, D. (2003). Spousal responses are differentially associated with clinical variables in women and men with chronic pain. *The Clinical Journal of Pain, 19,* 217-224.

Fillingim, R. B., King, C. D., Ribeiro-Dasilva, M. C., Rahim-Williams, B., & Riley, J. L. (2009). Sex, gender, and pain: A review of recent clinical and experimental findings. *The Journal of Pain, 10,* 447-485.

Flink, I. L., Boersma, K., & Linton, S. J. (2013). Pain catastrophizing as repetitive negative thinking: A development of the conceptualization. *Cognitive Behaviour Therapy, 42,* 215-223.

Flor, H., Breitenstein, C., Birbaumer, N., & Fürst, N. (1995). A psychophysiological analysis of spouse solicitousness towards pain behaviours, spouse interaction, and pain perception. *Behaviour Therapy, 26,* 255-272.

Flor, H., Kerns, R. D., & Turk, D. C. (1987). The role of spouse reinforcement, perceived pain, and activity levels of chronic pain patients. *Journal of Psychosomatic Research, 31,* 251-259.

Fordyce, W. E., Fowler, R. S., Lehmann, J. F., & DeLateur, B. J. (1968). Some implications of learning in problems of chronic pain. *Journal of Chronic Diseases, 21,* 179-190.

Forsythe, A. P., Romano, J. M., Jensen, M. P., & Thorn, B. E. (2012). Attachment style is associated with perceived spouse responses and pain-related outcomes. *Rehabilitation Psychology, 57,* 290-300.

Forsythe, A. P., Thorn, B., Day, M., & Shelby, G. (2011). Race and sex differences in primary appraisals, catastrophizing, and experimental pain outcomes. *The Journal of Pain, 12,* 563-572.

Fraley, R. C. (2002). Attachment stability from infancy to adulthood: Meta-analysis and dynamic modeling of developmental mechanisms. *Personality and Social Psychology Review, 6*, 123-151.

Fraley, R. C., & Brumbaugh, C. C. (2004). A dynamical systems approach to conceptualizing and studying stability and change in attachment security. In W. S. Rholes & J. A. Simpson (Eds.), *Adult attachment: Theory, research, and clinical implications* (pp. 86–132). New York, NY: Guilford Press.

Fraley, R. C., Heffernan, M. E., Vicary, A. M., & Brumbaugh, C. C. (2011). The Experiences in Close Relationships-Relationship Structures questionnaire: A method for assessing attachment orientations across relationships. *Psychological Assessment, 23*, 615-625

Fraley, R. C., Niedenthal, P. M., & Marks, M., Brumbaugh, C., & Vicary, A. (2006). Adult attachment and the perception of emotional expressions: Probing the hyperactivating strategies underlying anxious attachment. *Journal of Personality, 74*, 1163-1190.

Fraley, R. C., & Shaver, P. R. (1998). Airport separations: A naturalistic study of adult attachment dynamics in separating couples. *Journal of Personality and Social Psychology, 75*, 1198-1212.

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology, 78*, 350-365.

Frías, M. T., & Shaver, P. R. (2014). The moderating role of attachment insecurities in the association between social and physical pain. *Journal of Research in Personality, 53*, 193-200,

Gauthier, L. R., Rodin, G., Zimmermann, C., Warr, D., Librach, S. L., Moore, M., ... Gagliese, L. (2012). The communal coping model and cancer pain: The roles of catastrophizing and attachment style. *The Journal of Pain, 13*, 1258-1268.

Gauthier, N., Thibault, P., & Sullivan, M. J. L. (2011). Catastrophizers with chronic pain display more pain behaviour when in a relationship with a low catastrophizing spouse. *Pain Research & Management, 16*, 293-299.

Gellatly, R., & Beck, A. T. (2016). Catastrophic thinking: A transdiagnostic process across psychiatric disorders. *Cognitive Therapy and Research, 40*, 441-452.

González-Prendes, A. A., & Resko, S. M. (2012). Cognitive-behaviour theory. In S. S. Ringel & J. R. Brandell (Eds.), *Trauma: Contemporary directions in theory, practice, and research* (pp. 14-40). Thousand Oaks, California: SAGE Publications, Inc.

Green, S. B. (1991). How many subjects does it take to do a regression analysis. *Multivariate Behavioural Research, 26*, 499-510.

Grönblad, M., Hupli, M., Wennerstrand, P., Järvinen, E., Lukinmaa, A., Kouri, J-P., & Karaharju, E. O. (1993). Intercorrelation and test-retest reliability of the Pain Disability Index (PDI) and the Oswestry Disability Questionnaire (ODQ) and their correlation with pain intensity in low back pain patients. *Clinical Journal of Pain, 9*, 189-195.

Grossmann, K., Grossmann, K. E., & Kindler, H. (2005) Early care and the roots of attachment and partnership representations in the Bielefeld and Regensburg Longitudinal Studies. In K. E. Grossmann, K. Grossmann, E. Waters (Eds.), *Attachment from infancy to adulthood: The major longitudinal studies* (pp. 98-136). New York, NY: Guilford Press.

Gur-Yaish, N., Zisberg, A., & Levin, C. (2014). Attachment toward the informal caregiver and perception of the amount of support received after elective surgery. *Journal of Health Psychology, n.v*, 1-9.

Hadjistavropoulos, T., & Craig, K. D. (2002). A theoretical framework for understanding self-report and observational measures of pain: A communication model. *Behaviour Research and Therapy, 40*, 551-570.

Hadjistavropoulos, T., Craig, K. D., Duck, S., Cano, A., Goubert, L., Jackson, P. L., … Fitzgerald, T. D. (2011). A biopsychosocial formulation of pain. *Psychological Bulletin, 137*, 910-939.

Hamilton, C. E. (2000). Continuity and discontinuity of attachment from infancy through adolescence. *Child Development, 71*, 690-694.

Hays, R. D., & Morales, L. S. (2001). The RAND-36 measure of health-related quality of life. *Annals of Medicine, 33*, 350-357.

Hays, R. D., Sherbourne, C. D., & Mazel, R. M. (1993). The RAND 36-Item Health Survey 1.0. *Health Economics, 2*, 217-227.

Hendrick, S. S. (1988). A generic measure of relationship satisfaction. *Journal of Marriage and the Family, 50*, 93-98.

Hendrick, S. S., Dicke, A., & Hendrick, C. (1998). The relationship assessment scale. *Journal of Social and Personal Relationships, 15*, 137-142.

Hoskin, R. (2012, March 3). The dangers of self report. *Science Brainwaves.* Retrieved from http://www.sciencebrainwaves.com/

Hunter, J., & Maunder, R. (Eds.). (2016). *Improving patient treatment with attachment theory: A guide for primary care practitioners and specialists.* Switzerland: Springer International Publishing.

Hurter, S., Paloyelis, Y., Williams, A. C., & Fotopoulou, A. (2014). Partners' empathy increases pain ratings: Effects of perceived empathy and attachment style on pain report and display. *The Journal of Pain, 15*, 934-944.

Jackson, P. L., Meltzoff, A. N., & Decety, J. (2005). How do we perceive the pain of others? A window into the neural processes involved in empathy. *NeuroImage, 24*, 771-779.

Jackson, P. L., Rainville, P., & Decety, J. (2006). To what extent do we share the pain of others? Insight from the neural bases of pain empathy. *Pain, 125*, 5-9.

Jenkinson, C., Coulter, A., & Wright, L. (1993). Short Form 36 (SF 36) Health Survey Questionnaire: Normative data for adults of working age. *British Medical Journal, 306*, 1437-1440.

Jenkinson, C., Stewart-Brown, S., Peterson, S., & Paice, C. (1999). Assessment of the SF-36 version 2 in the United Kingdom. *Journal of Epidemiology and Community Health, 53*, 46-50.

Jenkinson, C., Wright, L., & Coulter, A. (1994). Criterion validity and reliability of the SF-36 in a population sample. *Quality of Life Research, 3*, 7-12.

Jensen, I., Nygren, A., Gamberale, F., Goldie, I., & Westerholm, P. (1994). Coping with long-term musculoskeletal pain and its consequences: Is gender a factor? *Pain, 57*, 167-172.

Jensen, M. P., Turner, J. A., Romano, J. M., & Fisher, L. D. (1999). Comparative reliability and validity of chronic pain intensity measures. *Pain, 83*, 157-162.

Johannes, C. B., Le, T. K., Zhou, X., Johnston, J. A., & Dworkin, R. H. (2010). The prevalence of chronic pain in United States adults: Results of an internet-based survey. *The Journal of Pain, 11*, 1230-1239.

Junghaenel, D. U., Schneider, S., & Broderick, J. E. (2017). Partners' overestimation of patients' pain severity: Relationships with partners' interpersonal responses. *Pain Medicine,* Advance online publication.

Keefe, F. J., Brown, G. K., Wallston, K. A., & Caldwell, D. S. (1989). Coping with rheumatoid arthritis pain: Catastrophizing as a maladaptive strategy. *Pain, 37*, 51-56.

Keefe, F. J., Lefebvre, J. C., Egert, J. R., Affleck, G., Sullivan, M. J., & Caldwell, D. S. (2000). The relationship of gender to pain, pain behaviour, and disability in osteoarthritis patients: The role of catastrophizing. *Pain, 87*, 325-334.

Keefe, F. J., Lipkus, I., Lefebvre, J. C., Hurwitz, H., Clipp, E., Smith, J., & Porter, L. (2003). The social context of gastrointestinal cancer pain: A preliminary study examining the relation of patient pain catastrophizing to patient perceptions of social support and caregiver stress and negative responses. *Pain, 103*, 151-156.

Kennedy, J., Roll, J. M., Schraudner, T., Murphy, S., & McPherson, S. (2014). Prevalence of persistent pain in the U.S. adult population: New data from the 2010 National Health Interview Survey. *The Journal of Pain, 15*, 979-984.

Kerns, R. D., & Rosenberg, R. (1995). Pain-relevant responses from significant others: development of a significant-other version of the WHYMPI scales. *Pain, 61*, 245-249.

Kerns, R. D., Turk, D. C., & Rudy, T. E. (1985). The West Haven-Yale Multidimensional Pain Inventory (WHYMPI). *Pain, 23*, 345-356.

Kline, R. B. (2010). *Principles and practice of structural equation modeling.* New York, NY: Guildford Press.

Klohnen, E. C., & Bera, S. (1998). Behavioural and experiential patterns of avoidantly and securely attached women across adulthood: A 31-year longitudinal perspective. *Journal of Personality and Social Psychology, 74*, 211-223.

Knapp, P., & Beck, A. T. (2008). Cognitive therapy: foundations, conceptual models, applications and research. *Revista Brasileira de Psiquiatria, 30*, 54-64.

Kowal, J., McWilliams, L., Péloquin, K., Wilson, K., Henderson, P., & Fergusson, D. (2015). Attachment insecurity predicts responses to an interdisciplinary chronic pain rehabilitation program. *Journal of Behavioural Medicine, 38*, 518-526.

Kowal, J., Wilson, K. G., McWilliams, L. A., Péloquin, K., & Duong, D. (2012). Self-perceived burden in chronic pain: Relevance, prevalence, and predictors. *Pain, 153*, 1735-1741.

Krahé, C., Paloyelis, Y., Condon, H., Jenkinson, P. M., Williams, S. C., & Fotopoulou, A. (2015). Attachment style moderates partner presence effects on pain: a laser-evoked potentials study. *Social Cognitive and Affective Neuroscience, 10*, 1030-1037.

Kratz, A. L., Davis, M. C., & Zautra, A. J. (2012). Attachment predicts daily catastrophizing and social coping in women with pain. *Health Psychology, 31*, 278-285.

Kunce, L. J., & Shaver, P. R. (1994). An attachment-theoretical approach to caregiving in romantic relationships. In K. Bartholomew & D. Perlman (Eds.), *Advances in personal relationships* (Vol. 5, pp. 205-237). London: Kingsley.

Laird, K. T., Preacher, K. J., & Walker, L. S. (2015). Attachment and adjustment in adolescents and young adults with a history of pediatric functional abdominal pain. *The Clinical Journal of Pain, 31*, 152-158.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.

Leonard, M. T., Cano, A., & Johansen, A. B. (2006). Chronic pain in a couples context: A review and integration of theoretical models and empirical evidence. *The Journal of Pain, 7*, 377-390.

Lewandowski, A. S., Palermo, T. M., Kirchner, L., & Drotar, D. (2009). Comparing diary and retrospective reports of pain and activity restriction in children and adolescents with chronic pain conditions. *Clinical Journal of Pain, 25*, 299-306.

Lewis, M., Feiring, C., & Rosenthal, S. (2000). Attachment over time. *Child Development, 71*, 707-720.

Lousberg, R., Schmidt, A. J. M., & Groenman, N. H. (1992). The relationship between spouse solicitousness and pain behaviour: Searching for more experimental evidence. *Pain, 51*, 75-79.

Lumley, M. A., Sklar, E. R., & Carty, J. N. (2012). Emotional disclosure interventions for chronic pain: From the laboratory to the clinic. *Translational Behavioural Medicine, 2*, 73-81.

MacDonald, G. (2008). Use of pain threshold reports to satisfy social needs. *Pain Research and Management, 13*, 309-319.

MacDonald, G., Locke, K. D., Spielmann, S. S., & Joel, S. (2012). Insecure attachment predicts ambivalent social threat and reward perceptions in romantic relationships. *Journal of Social and Personal Relationships, 30*, 647-661.

Main, M. (1990). Cross-cultural studies of attachment organization: Recent studies, changing methodologies, and the concept of conditional strategies. *Human Development, 33*, 48-61.

Manne, S., Alfieri, T., Taylor, K., & Dougherty, J. (1999). Preferences for spousal support among individuals with cancer. *Journal of Applied Social Psychology, 29*, 722-749.

Matos, M., Bernardes, S. F., Goubert, L., & Beyers, W. (2017). Buffer or amplifier? Longitudinal effects of social support for functional autonomy/dependence on older adults' chronic pain experiences. *Health Psychology, 36*, 1195-1206.

McCracken, L. M. (2005). Social context and acceptance of chronic pain: The role of solicitous and punishing responses. *Pain, 113*, 155-159.

McGeary, C. A., Blount, T. H., Peterson, A. L., Gatchel, R. J., Hale, W. J., & McGeary, D. D. (2016). Interpersonal responses and pain management within the US military. *Journal of Occupational Rehabilitation, 26*, 216-228.

McWilliams, L. A., & Asmundson, G. J. G. (2007). The relationship of adult attachment dimensions to pain-related far, hypervigilance, and catastrophizing. *Pain, 127*, 27-34.

McWilliams, L. A., Dick, B. D., Bailey, K., Verrier, M. J., & Kowal, J. (2012). A psychometric evaluation of the Pain Response Preference Questionnaire in a chronic pain patient sample. *Health Psychology, 31*, 343-351.

McWilliams, L. A., & Holmberg, D. (2010). Adult attachment and pain catastrophizing for self and significant other. *Pain, 149*, 278-283.

McWilliams, L. A., & Kowal, J., Sharpe, D., & Dick, B. D. (2014). Psychometric evaluation and refinement of the Pain Response Preference Questionnaire. *Pain Research and Management, 19*, 42-48.

McWilliams, L. A., Kowal, J., Verrier, M., & Dick, B. D. (2017). Do pain-related support preferences moderate relationships between chronic pain patients' reports of support received and psychosocial functioning? *Pain Medicine, 18*, 2331–2339.

McWilliams, L. A., Kowal, J., & Wilson, K. G. (2015). Development and evaluation of short forms of the Pain Catastrophizing Scale and the Pain Self-efficacy Questionnaire. *European Journal of Pain, 19*, 1342-1349.

McWilliams, L. A., Murphy, P. D., & Bailey, S. J. (2010). Associations between adult attachment dimensions and attitudes toward pain behaviour. *Pain Research and Management, 15*, 378-384.

McWilliams, L. A., Saldanha, K. M., Dick, B. D., & Watt, M. C. (2009). Development and psychometric evaluation of a new measure of pain-related support preferences: The Pain Response Preference Questionnaire. *Pain Research and Management, 14*, 461-469.

Meredith, P. J. (2013). A review of the evidence regarding associations between attachment theory and experimentally induced pain. *Current Pain and Headache Report (Article 326), 17*, 1-9.

Meredith, P. J. (2016). Attachment theory and pain. In J. Hunter & R. Maunder (Eds.), *A guide for primary care practitioners and specialists* [electronic book] (pp. 55-73). doi:10.1007/978-3-319-23300-0

Meredith, P. J., Ownsworth, T., & Strong, J. (2008). A review of the evidence linking adult attachment theory and chronic pain: Presenting a conceptual model. *Clinical Psychology Review, 28*, 407-429.

Meredith, P. J., Strong, J., & Feeney, J. A. (2005). Evidence of a relationship between adult attachment variables and appraisals of chronic pain. *Pain Research and Management, 10*, 191-200.

Meredith, P. J., Strong, J., & Feeney, J. A. (2006a). Adult attachment, anxiety and pain self-efficacy as predictors of pain intensity and disability. *Pain, 123*, 146-154.

Meredith, P. J., Strong, J., & Feeney, J. A. (2006b). The relationship of adult attachment to emotion, catastrophizing, control, threshold and tolerance, in experimentally-induced pain. *Pain, 120*, 44-52.

Meredith, P. J., Strong, J., & Feeney, J. A. (2007). Adult attachment variables predict depression before and after treatment for chronic pain. *European Journal of Pain, 11*, 164-170.

Mickelson, K. D., Kessler, R. C., & Shaver, P. R. (1997). Adult attachment in a nationally representative sample. *Journal of Personality and Social Psychology, 73*, 1092-1106.

Mikail, S. F., Henderson, P. R., & Tasca, G. A. (1994). An interpersonally based model of chronic pain: An application of attachment theory. *Clinical Psychology Review, 14*, 1-16.

Mikulincer, M., Birnbaum, G., Woddis, D., & Nachmias, O. (2000). Stress and accessibility of proximity-related thoughts: Exploring the normative and intraindividual components of attachment theory. *Journal of Personality and Social Psychology, 78*, 509-523.

Mikulincer, M., & Florian, V. (1995). Appraisal of and coping with a real-life stressful situation: The contribution of attachment styles. *Personality and Social Psychology Bulletin, 21*, 406-414.

Mikulincer, M., Gillath, O., Halevy, V., Avihou, N., Avidan, S., & Eshkoli, N. (2001). Attachment theory and reactions to others' needs: Evidence that activation of the sense of attachment security promotes empathic responses. *Journal of Personality and Social Psychology, 81*, 1205-1224.

Mikulincer, M., Gillath, O., & Shaver, P. R. (2002). Activation of the attachment system in adulthood: Threat-related primes increase the accessibility of mental representations of attachment figures. *Journal of Personality and Social Psychology, 83*, 881-895.

Mikulincer, M., & Orbach, I. (1995). Attachment styles and repressive defensiveness: The accessibility and architecture of affective memories. *Journal of Personality and Social Psychology, 68*, 917-925.

Mikulincer, M., & Shaver, P. R. (2003). The attachment behavioural system in adulthood: Activation, psychodynamics, and interpersonal processes. In M. Zanna (Ed.), *Advances in experimental social psychology (Vol. 35)*. New York, NY: Academic Press.

Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change.* New York, NY: Guildford Press.

Mikulincer, M., & Shaver, P. R. (2009). An attachment and behavioural systems perspective on social support. *Journal of Social and Personal Relationships, 26*, 7-19.

Mikulincer, M., & Shaver, P. R. (2016). *Attachment in adulthood: Structure, dynamics, and change* (2nd ed.). New York, NY: Guildford Press.

Mikulincer, M., Shaver, P. R., Bar-On, N., & Ein-Dor, T. (2010). The pushes and pulls of close relationships: Attachment insecurities and relational ambivalence. *Journal of Personality and Social Psychology, 98*, 450-468.

Morrison, I., Lloyd, D., di Pellegrino, G., & Roberts, N. (2004). Vicarious responses to pain in anterior cingulate cortex: Is empathy a multisensory issue? *Cognitive, Affective, & Behavioral Neuroscience, 4*, 270-278.

Newton-John, T. R. (2015, November 24). Not helping a partner with chronic pain may be the quickest road to recovery. *The Conversation*. Retrieved from https://theconversation.com/ca

Newton-John, T. R., & Williams, A. C. (2006). Chronic pain couples: Perceived marital interactions and pain behaviours. *Pain, 123*, 53-63.

Nickerson, A. B., Mele, D., & Princiotta, D. (2008). Attachment and empathy as predictors of roles as defenders or outsiders in bullying interactions. *Journal of School Psychology, 46*, 687-703.

Ognibene, T. C., & Collins, N. L. (1998). Adult attachment styles, perceived social support and coping strategies. *Journal of Social and Personal Relationships, 15*, 323-345.

Osman, A., Barrios, F. X., Gutierrez, P. M., Kopper, B. A., Merrifield, T., & Grittmann, L. (2000). The Pain Catastrophizing Scale: Further psychometric evaluation with adult samples. *Journal of Behavioural Medicine, 23*, 351-365.

Osman, A., Barrios, F. X., Kopper, B. A., Hauptmann, W., Jones, J., & O'Neill, E. (1997). Factor structure, reliability, and validity of the Pain Catastrophizing Scale. *Journal of Beaioural Medicine, 20*, 589-605.

Papas, R. K., Robinson, M. E., & Riley, J. L. (2001). Perceived spouse responsiveness to chronic pain: Three empirical subgroups. *The Journal of Pain, 2*, 262-269.

Pollard, C. A. (1984). Preliminary validity study of the Pain Disability Index. *Perceptual and Motor Skills, 59*, 974.

Porter, L. S., Davis, D., & Keefe, F. J. (2007). Attachment and pain: Recent findings and future directions. *Pain, 128*, 195-198.

Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioural Statistics, 4*, 437-448.

Priel, B., & Shamai, D. (1995). Attachment style and perceived social support: Effects of affect regulation. *Personality and Individual Differences, 19*, 235-241.

Quartana, P. J., Campbell, C. M., & Edwards, R. R. (2009). Pain catastrophizing: A critical review. *Expert Review of Neurotherapeutics, 9*, 745-758.

RAND Health. (n.d.). *36-Item short form survey (SF-36) scoring instructions.* Retrieved from https://www.rand.org/health/surveys_tools/mos/36-item-short-form/scoring.html

Reevy, G. M., & Maslach, C. (2001). Use of social support: Gender and personality differences. *Sex Roles, 44*, 437-459.

Reis, H., & Shaver, P. (1988). Intimacy as an interpersonal process. In S. W. Duck, D. F. Hay, S. E. Hobfoll, W. Ickes, & B. M. Montgomery (Eds.). *Handbook of personal relationships: Theory, research and interventions* (pp. 367-389). Oxford, England: John Wiley & Sons.

Reitsma, M. L., Tranmer, J. E., Buchanan, D. M., & Vandenkerkhof, E. G. (2011). The prevalence of chronic pain and pain-related interference in the Canadian population from 1994 to 2008. *Chronic Diseases and Injuries in Canada, 31,* 157-164.

Romano, J. M., Jensen, M. P., Turner, J. A., Good, A. B., & Hops, H. (2000). Chronic pain patient-partner interactions: Further support for a behavioural model of chronic pain. *Behaviour Therapy, 31,* 415-440.

Romano, J. M., Turner, J. A., Friedman, L. S., Bulcroft, R. A., Jensen, M. P., Hops, H., & Wright, S. F. (1992). Sequential analysis of chronic pain behaviours and spouse responses. *Journal of Consulting and Clinical Psychology, 60,* 777-782.

Romano, J. M., Turner, J. A., Jensen, M. P., Friedman, L. S., Bulcroft, R. A., Hops, H., & Wright, S. F. (1995). Chronic pain patient-spouse behavioural interactions predict patient disability. *Pain, 63,* 353-360.

Romeo, A., Tesio, V., Castelnuovo, G., & Castelli, L. (2017). Attachment style and chronic pain: Toward an interpersonal model of pain. *Frontiers in Psychology, 8,* 1-6.

Ronen, S., & Mikulincer, M. (2012). Predicting employees' satisfaction and burnout from managers' attachment and caregiving orientations. *European Journal of Work and Organizational Psychology, 21,* 828-849.

Rowe, A. C., Carnelley, K. B., Harwood, J., Micklewright, D., Russouw, L., Rennie, C. L., & Liossi, C. (2012). The effect of attachment orientation priming on pain sensitivity in pain-free individuals. *Journal of Social and Personal Relationships, 29,* 488-507.

Saarela, M. V., Hlushchu, Y., Williams, A. C., Schurmann, M., Kalso, E., & Hari, R. (2007). The compassionate brain: Humans detect intensity of pain from another's face. *Cerebral Cortex, 17,* 230-237.

Schmidt, A. J. M. (1987). The behavioral management of pain: A criticism of a response. *Pain, 30,* 285-291.

Schwarz, N. (2007). Retrospective and concurrent self-reports: The rationale for real-time data capture. In A. Stone, S. Shiffman, A. Atienza & L. Nebeling (Eds.), *The science of real-*

time data capture: Self-reports in health research (pp. 11-26). New York, NY: Oxford University Press, Inc.

Schwartz, L., Slater, M. A., & Birchler, G. R. (1996). The role of pain behaviours in the modulation of marital conflict in chronic pain couples. *Pain, 65*, 227-233.

Severeijns, R., Vlaeyen, J. W., & van den Hout, M. A. (2004). Do we need a communal coping model of pain catastrophizing? An alternative explanation. *Pain, 111*, 226-229.

Sharp, T. J., & Nicholas, M. K. (2000). Assessing the significant others of chronic pain patients: The psychometric properties of significant other questionnaires. *Pain, 88*, 135-144.

Shaver, P. R., & Hazan, C. (1988). A biased overview of the study of love. *Journal of Social and Personal Relationships, 5*, 473-501.

Shaver, P. R., & Hazan, C. (1993). Adult romantic attachment: Theory and evidence. In D. Perlman & W. Jones (Eds.), *Advances in personal relationships* (Vol. 4, pp. 29-70). London: Jessica Kingsley.

Shaver, P. R., & Mikulincer, M. (2007). Adult attachment strategies and the regulation of emotion. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 446-465). New York, NY: Guilford Press.

Shaver, P. R., Papalia, D., Clark, C. L., Koski, L. R., Tidwell, M. C., & Nalbone, D. (1996). Androgyny and attachment security: Two related models of optimal personality. *Personality and Social Psychology Bulletin, 22*, 582-597.

Shumaker, S. A., & Hill, D. R. (1991). Gender differences in social support and physical health. *Health Psychology, 10*, 102-111.

Sibley, C. G., Fischer, R., & Liu, J. H. (2005). Reliability and validity of the Revised Experiences in Close Relationships (ECR-R) self-report measure of adult romantic attachment. *Personality and Social Psychology Bulletin, 31*, 1524-1536.

Simpson, J. A. (1990). Influence of attachment style on romantic relationships. *Journal of Personality and Social Psychology, 59*, 971-980.

Simpson, J. A., Rholes, W. S., & Nelligan, J. S. (1992). Support seeking and support giving within couples in an anxiety-provoking situation: The role of attachment styles. *Journal of Personality and Social Psychology, 62*, 434-446.

Simpson, J. A., Rholes, W. S., Oriña, M. M., & Grich, J. (2002).Working models of attachment, support giving, and support seeking in a stressful situation. *Personality and Social Psychology Bulletin, 28*, 598-608.

Stroud, M. W., Turner, J. A., Jensen, M. P., & Cardenas, D. D. (2006). Partner responses to pain behaviours are associated with depression and activity interference among persons with chronic pain and spinal cord injury. *The Journal of Pain, 7*, 91-99.

Stubbs, D., Krebs, E., Bair, M., Damush, T., Wu, J., Sutherland, J., & Kroenke, K. (2010). Sex differences in pain and pain-related disability among primary care patients with chronic musculoskeletal pain. *Pain Medicine, 11*, 232-239.

Sullivan, G. M., & Feinn, R. (2012). Using effect size – Or why the P value is not enough. *Journal of Graduate Medical Education, 4*, 279-282.

Sullivan, M. J. L. (1995). *PCS: The pain catastrophizing scale* [User Manual]. Departments of Psychology, Medicine, and Neurology School of Physical and Occupational Therapy. McGill University. Montreal, Quebec H3A 1B1. Retrieved from http://sullivan-painresearch.mcgill.ca/pcs1.php

Sullivan, M. J. L. (2012). The Communal Coping Model of Pain Catastrophizing: Clinical and research implications. *Canadian Psychology, 53*, 32-41.

Sullivan, M. J. L., Adams, H., & Sullivan, M. E. (2004). Communicative dimensions of pain catastrophizing: Social cueing effects on pain behaviour and coping. *Pain, 107*, 220-226.

Sullivan, M. J. L., Bishop, S. R., & Pivik, J. (1995). The Pain Catastrophizing Scale: Development and validation. *Psychological Assessment, 7*, 524-532.

Sullivan, M. J. L., Martel, M. O., Tripp, D., Savard, A., & Crombez, G. (2006). The relation between catastrophizing and the communication of pain experience. *Pain, 122*, 282-288.

Sullivan, M. J. L., Stanish, W., Waite, H., Sullivan, M., & Tripp, D. A. (1998). Catastrophizing, pain, and disability in patients with soft tissue injuries. *Pain, 77*, 253-260.

Sullivan, M. J. L., Thorn, B., Haythornthwaite, J. A., Keefe, F. J., Martin, M., Bradley, L. A., & Lefebvre, J. C. (2001). Theoretical perspectives on the relation between catastrophizing and pain. *Clinical Journal of Pain, 17*, 52-64.

Sullivan, M. J. L., Tripp, D. A., Rodgers, W. M., & Stanish, W. (2000). Catastrophizing and pain perception sports participants. *Journal of Applied Sport Psychology, 12*, 151-167.

Sullivan, M. J. L., Tripp, D. A., & Santor, D. (2000). Gender differences in pain and pain behaviour: The role of catastrophizing. *Cognitive Therapy and Research, 24*, 121-134.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston: Pearson.

Tait, R. C., Chibnall, J. T., & Krause, S. (1990). The Pain Disability Index: Psychometric properties. *Pain, 14*, 171–82.

Tait, R. C., Pollard, C. A., Margolis, R. B., Duckro, P. N., & Krause, S. J. (1987). The Pain Disability Index: Psychometric and Validity Data. *Archives of Physical Medicine and Rehabilitation, 68*, 438-441.

Tamres, L. K., Janicki, D., & Helgeson, V. S. (2002). Sex differences in coping behaviour: A meta-analytic review and an examination of relative coping. *Personality and Social Psychology Review, 6*, 2-30.

Terrighena, E. L., & Lee, T. M. C. (2017). The neuroimaging of vicarious pain. In L. Saba (Ed.), *Neuroimaging of pain* [electronic book] (pp. 411-451). doi:10.1007/978-3-319-48046-6

Thibault, P., Loisel, P., Durand, M. J., Catchlove, R., & Sullivan, M. J. L. (2008). Psychological predictors of pain expression and activity intolerance in chronic pain patients. *Pain, 139*, 47-54.

Tomakowsky, J., Carty, J. N., Lumley, M. A., & Peters, K. M. (2016). The role of social constraints and catastrophizing in pelvic and urogenital pain. *International Urogynecology Journal, 27*, 1157-1162.

Turk, D. C., & Flor, H. (1987). Pain > pain behaviors: The utility and limitations of the pain behavior construct. *Pain, 31*, 277-295.

Van Damme, S., Crombez, G., Bijttebier, P., Goubert, L., & Van Houdenhove, B. (2002). A confirmatory factor analysis of the Pain Catastrophizing Scale: Invariant factor structure across clinical and non-clinical populations. *Pain, 96*, 319-324.

Van Denburg, A. N., Shelby, R. A., Caldwell, D. S., O'Sullivan, M. L., & Keefe, F. J. (2018). Self-Efficacy for pain communication moderates the relation between ambivalence over emotional expression and pain catastrophizing among patients with osteoarthritis. *The Journal of Pain, 19*, 1006-1014.

Vaugh, M. J., & Matyastik Baier, M. E. (1999). Reliability and validity of the relationship assessment scale. *The American Journal of Family Therapy, 27*, 137-147.

Vlaeyen, J. W., Hanssen, M., Goubert, L., Vervoort, T., Peters, M., van Breukelen, G.,… Morely, S. (2009). Threat of pain influences social context effects on verbal pain report and facial expression. *Behaviour Research and Therapy, 47*, 774-782.

Vlaeyen, J. W., & Linton, S. J. (2000). Fear-avoidance and its consequences in chronic musculoskeletal pain: A state of the art. *Pain, 85*, 317-332.

Vogel, D. L., & Wei, M. (2005). Adult attachment and help-seeking intent: The mediating roles of psychological distress and perceived social support. *Journal of Counselling Psychology, 52*, 347-357.

Ware, J. E., & Gandek, B. (1998). Overview of the SF-36 health survey and the international quality of life assessment (IQOLA) project. *Journal of Clinical Epidemiology, 51*, 903-912.

Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-ltem Short-Form Health Survey (SF-36): I. Conceptual framework and item selection. *Medical Care, 30*, 473-483.

Waters, E., Merrick, S., Treboux, D., Crowell, J., & Albersheim, L. (2000). Attachment security in infancy and early adulthood: A twenty-year longitudinal study. *Child Development, 71*, 684-689.

Wei, M., Russell, D. W., Mallinckrodt, B., & Vogel, D. L. (2007). The experiences in Close Relationship Scale (ECR)-Short Form: Reliability, validity, and factor structure. *Journal of Personality Assessment, 88*, 187-204.

Wei, M., Russell, D. W., & Zakalik, R. A. (2005). Adult attachment, social self-efficacy, self-disclosure, loneliness, and subsequent depression for freshman college students: A longitudinal study. *Journal of Counselling Psychology, 52*, 602-614.

Weinfield, N. S., Sroufe, L., & Egeland, B. (2000). Attachment from infancy to early adulthood in a high-risk sample: Continuity, discontinuity, and their correlates. *Child Development, 71*, 695-702.

Weiss, L. H., & Kerns, R. D. (1995). Patterns of pain-relevant social interactions. *International Journal of Behavioural Medicine, 2*, 157-171.

Williams, A. C. (2002). Facial expression of pain: An evolutionary account. *Behavioral and Brain Sciences, 25*, 439-488.

Williams, M. N., Grajales, C. A., & Kurkiewicz, D. (2013). Assumptions of multiple regression: Correcting two misconceptions. *Practical Assessment, Research & Evaluation, 18*. Retrieved from http://pareonline.net/getvn.asp?v=18&n=12

Williamson, D., Robinson, M. E., & Melamed, B. (1997). Pain behavior, spouse responsiveness, and marital satisfaction in patients with rheumatoid arthritis. *Behavior Modification, 21*, 97-118.

Wilson, S. J., Martire, L. M., & Sliwinski, M. J. (2017). Daily spousal responsiveness predicts longer-term trajectories of patients' physical function. *Psychological Science, 28*, 786-797.

Wilson, C. L., & Ruben, M. A. (2011). A pain in her arm: Romantic attachment orientations and the tourniquet task. *Personal Relationships, 18*, 242-265.

Zhang, L., Zhang, S., Yang, Y., & Li, C. (2017). Attachment orientations and dispositional gratitude: The mediating roles of perceived social support and self-esteem. *Personality and Individual Differences, 114*, 193-197.

Table 3.1

Study 1 List of Hypotheses and Open Research Questions

Label	Hypotheses and Open Research Questions
H1a	Support seeker anxiety will be positively associated with support seekers' reports of solicitous support wanted.
H1b	Support seeker anxiety will be positively associated with caregivers' perception of solicitous support wanted.
H2a	Support seeker avoidance will be negatively associated with support seekers' reports of solicitous support wanted.
H2b	Support seeker avoidance will be negatively associated with caregivers' perception of solicitous support wanted.
H3a	Support seeker pain catastrophizing will be positively associated with support seekers' reports of solicitous support wanted.
H3b	Support seeker pain catastrophizing will be positively associated with caregivers' perception of solicitous support wanted.
R1a	No hypothesis proposed for caregiver anxiety and support seekers' reports of solicitous support wanted.
R1b	No hypothesis proposed for caregiver anxiety and caregivers' perception of solicitous support wanted.
R2a	No hypothesis proposed for caregiver avoidance and support seekers' reports of solicitous support wanted.
R2b	No hypothesis proposed for caregiver avoidance and caregivers' perception of solicitous support wanted.
R3a	No hypothesis proposed for caregiver pain catastrophizing and support seekers' reports of solicitous support wanted.
R3b	No hypothesis proposed for caregiver pain catastrophizing and caregivers' perception of solicitous support wanted.
H4a	Support seeker anxiety will be negatively associated with support seekers' perception of solicitous support provided.
R4b	No hypothesis proposed for support seeker anxiety and caregivers' reports of solicitous support provided.
R5a	No hypothesis proposed for support seeker avoidance and support seekers' perception of solicitous support provided.
R5b	No hypothesis proposed for support seeker avoidance and caregivers' reports of solicitous support provided.
H5a	Support seeker pain catastrophizing will be negatively associated with support seekers' reports of solicitous support provided.
H5b	No hypothesis proposed for support seeker pain catastrophizing and caregivers' reports of solicitous support provided.
R6a	No hypothesis proposed for caregiver anxiety and support seekers' perception of solicitous support provided.
R6b	No hypothesis proposed for caregiver anxiety and caregivers' reports of solicitous support provided.
H6a	Caregiver avoidance will be negatively associated with support seekers' perception of solicitous support provided.
H6b	Caregiver avoidance will be negatively associated with caregivers' reports of solicitous support provided.
H7a	Caregiver pain catastrophizing will be positively associated with support seekers' perception of solicitous support provided.
H7b	Caregiver pain catastrophizing will be negatively associated with caregivers' reports of solicitous support provided.

Table 3.2

Study 1 Descriptive Statistics (N = 164)

	Mean	*SD*	Score Range	*α*
Age[a]	27.85	9.73	18 – 63	-
Support Seeker Attachment Anxiety[b]	2.56	1.06	1 – 5.94	.92
Support Seeker Attachment Avoidance[b]	2.23	.91	1 – 5.44	.91
Caregiver Attachment Anxiety[b]	2.72	1.13	1 – 5.56	.92
Caregiver Attachment Avoidance[b]	2.37	.93	1 – 6.33	.92
Support Seeker PCS	12.45	9.86	0 – 49.00	.93
Caregiver PCS	12.27	9.67	0 – 39.00	.93
SSWss[c]	3.25	.43	2.30 – 4.00	.87
SSWcg[c]	3.18	.44	1.70 – 4.00	.83
SSPss[c]	3.28	.43	2.20 – 4.00	.85
SSPcg[c]	3.24	.45	1.10 – 4.00	.89

Note. PCS = Pain Catastrophizing Scale score; SSWss = solicitous support wanted as reported by support seekers; SSWcg = solicitous support wanted as perceived by caregivers; SSPss = solicitous support provided as perceived by support seekers; SSPcg = solicitous support provided as reported by caregivers.

[a]Age (years). [b]Measured using the Experiences in Close Relationships – Revised questionnaire (ECR-R). [c]Measured using the Pain Response Questionnaire – Support Seeker and Caregiver Versions (PRQ-SS, PRQ-CG).

Table 3.3

Study 1 Correlations between Demographic Variables, Attachment Variables, CCM Variables, and the PRQ Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. SS Sex[a]	–													
2. SS Age	-.19**	–												
3. CG Age	-.06	.93***	–											
4. Rel Length	-.04	.80***	.80***	–										
5. SS Anxiety[b]	.07	-.13	-.12	-.26***	–									
6. SS Avoidance[b]	-.06	.05	.06	-.07	.46***	–								
7. CG Anxiety[b]	.06	-.15	-.17*	-.24***	.29***	.30***	–							
8. CG Avoidance[b]	.18*	.13	.12	-.03	.27***	.07	.47***	–						
9. SS PCS	.26***	-.12	-.10	-.10	.27**	.03	.25***	.22***	–					
10. CG PCS	-.12	-.04	-.05	-.02	.07	.11	.19*	.03	.17*	–				
11. SSWss[c]	.29***	-.19*	-.19**	-.14	-.07	-.40***	.02	.10	.29***	.07	–			
12. SSWcg[c]	-.02	-.06	-.07	-.06	.00	-.27***	-.12	-.01	.19*	.02	.22***	–		
13. SSPss[c]	-.06	-.18*	-.20**	-.19**	-.22***	-.32***	-.05	-.19**	.05	.23***	.48***	.06	–	
14. SSPcg[c]	-.25***	-.10	-.13	-.09	-.08	-.06	-.14	-.46***	-.08	-.08	.02	.49**	.21***	–

Note. SS = Support Seekers; CG = Caregivers; PCS = Pain Catastrophizing Scale score; SSWss = solicitous support wanted as reported by support seekers; SSWcg = solicitous support wanted as perceived by caregivers; SSPss = solicitous support provided as perceived by support seekers; SSPcg = solicitous support provided as reported by caregivers.

[a]Sex (0 = male, 1 = female). [b]Measured using the Experiences in Close Relationships – Revised questionnaire (ECR-R). [c]Measured using the Pain Response Questionnaire – Support Seeker and Caregiver Versions (PRQ-SS, PRQ-CG).

Table 3.4

Study 1 Summary of Regression Analyses Predicting Solicitous Support Wanted Variables Using Attachment Variables

	Dependent Variable							
	SSWss[c]				SSWcg[c]			
	b	*SE b*	*β*		*b*	*SE b*	*β*	
Step 1								
SS Sex[a]	.25	.06	.29***		-.02	.07	-.02	
Relationship Length	-.06	.03	-.13		-.03	.04	-.06	
Δ R^2				.10***				.00
Step 2								
SS Sex[a]	.21	.06	.25***		-.05	.07	-.05	
Relationship Length	-.06	.03	-.14		-.03	.04	-.06	
SS Anxiety[b]	.02	.04	.05		.07	.04	.16	
SS Avoidance[b]	-.19	.03	-.44***		-.14	.04	-.33***	
CG Anxiety[b]	.03	.04	.07		-.04	.04	-.09	
CG Avoidance[b]	.02	.06	.04		.01	.04	.02	
Δ R^2				.17***				.10**
R^2				.27***				.11**
Step 3								
SS Sex[a]					-.01	.07	-.02	
Relationship Length					-.04	.04	-.09	
SS Anxiety[b]					.08	.04	.19*	
SS Avoidance[b]					-.16	.04	-.36***	
CG Anxiety[b]					-.05	.04	-.11	
CG Avoidance[b]					-.01	.04	-.03	
SS AnxXAvoid					.06	.03	.15	
CG AnxXAvoid					.07	.03	.19*	
Δ R^2								.05**
R^2								.15**

Note. SS = Support Seekers; CG = Caregivers; PCS = Pain Catastrophizing Scale score; SSWss = solicitous support wanted as reported by support seekers; SSWcg = solicitous support wanted as perceived by caregivers.

[a]Sex (0 = male, 1 = female). [b]Measured using the Experiences in Close Relationships – Revised questionnaire (ECR-R). [c]Measured using the Pain Response Questionnaire – Support Seeker and Caregiver Versions (PRQ-SS, PRQ-CG).

*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 3.5

Study 1 Summary of Regression Analyses Predicting Solicitous Support Provided Variables Using Attachment Variables

	Dependent Variable							
	SSPss[c]				SSPcg[c]			
	b	*SE b*	*β*		*b*	*SE b*	*β*	
Step 1								
SS Sex[a]	-.06	.07	-.07		-.23	.07	-.26***	
Relationship Length	-.09	.03	-.20**		-.05	.03	-.10	
Δ R^2				.04**				.07**
Step 2								
SS Sex[a]	-.04	.06	-.05		-.17	.06	-.19**	
Relationship Length	-.10	.03	-.23**		-.04	.03	-.09	
SS Anxiety[b]	-.05	.04	-.13		.03	.04	.06	
SS Avoidance[b]	-.13	.04	-.30***		-.04	.04	-.10	
CG Anxiety[b]	.05	.04	.11		.04	.04	.09	
CG Avoidance[b]	-.08	.04	-.19*		-.21	.04	-.48***	
Δ R^2				.16***				.19***
R^2				.20				.26***
Step 3								
SS Sex[a]	-.03	.06	-.03					
Relationship Length	-.11	.03	-.24**					
SS Anxiety[b]	-.04	.04	-.10					
SS Avoidance[b]	-.15	.04	-.34***					
CG Anxiety[b]	.04	.04	.10					
CG Avoidance[b]	-.08	.04	-.19*					
SS AnxXAvoid	.06	.03	.15*					
CG AnxXAvoid	.03	.03	.08					
Δ R^2				.02				
R^2				.22				

Note. SS = Support Seekers; CG = Caregivers; SSPss = solicitous support provided as perceived by support seekers; SSPcg = solicitous support wanted as reported by caregivers.
[a]Sex (0 = male, 1 = female). [b]Measured using the Experiences in Close Relationships – Revised questionnaire (ECR-R). [c]Measured using the Pain Response Questionnaire – Support Seeker and Caregiver Versions (PRQ-SS, PRQ-CG).
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 3.6

Study 1 Summary of Regression Analyses Predicting Solicitous Support Wanted Variables Using CCM Variables

	Dependent Variable							
	SSWss[b]				SSWcg[b]			
	b	*SE b*	*β*		*b*	*SE b*	*β*	
Step 1								
SS Sex[a]	.25	.06	.29***		-.02	.07	-.02	
Relationship Length	-.06	.03	-.13		-.03	.04	-.06	
ΔR^2				.10***				.00
Step 2								
SS Sex[a]	.21	.07	.24**		-.07	.07	-.08	
Relationship Length	-.05	.03	-.11		-.02	.03	-.04	
SS PCS	.09	.03	.20**		.09	.04	.21**	
CG PCS	.03	.03	.06		-.01	.04	-.03	
ΔR^2				.05**				.04*
R^2				.15***				.04

Note. SS = Support Seekers; CG = Caregivers; PCS = Pain Catastrophizing Scale score; SSWss = solicitous support wanted as reported by support seekers; SSWcg = solicitous support wanted as perceived by caregivers.

[a]Sex (0 = male, 1 = female). [b]Measured using the Pain Response Questionnaire – Support Seeker and Caregiver Versions (PRQ-SS, PRQ-CG).

*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 3.7

Study 1 Summary of Regression Analyses Predicting Solicitous Support Provided Variables Using CCM Variables

	Dependent Variable							
	SSPss[b]				SSPcg[b]			
	B	*SE b*	*β*		*b*	*SE b*	*β*	
Step 1								
SS Sex[a]	-.06	.07	-.07		-.23	.07	-.26***	
Relationship Length	-.09	.03	-.20**		-.05	.03	-.10	
Δ R^2				.04*				.07**
Step 2								
SS Sex[a]	-.04	.07	-.04					
Relationship Length	-.08	.03	-.19**					
SS PCS	.00	.04	.01					
CG PCS	.09	.03	.22**					
Δ R^2				.05*				
R^2				.09**				

Note. SS = Support Seekers; CG = Caregivers; PCS = Pain Catastrophizing Scale score; SSPss = solicitous support provided as perceived by support seekers; SSPcg = solicitous support provided as reported by caregivers.

[a]Sex (0 = male, 1 = female). [b]Measured using the Pain Response Questionnaire – Support Seeker and Caregiver Versions (PRQ-SS, PRQ-CG).

*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 3.8

Study 1 Comparing Attachment Theory and CCM Regression Models in Predicting Pain-Related Solicitous Support Variables

	SSWss	SSWcg	SSPss	SSPcg
Attachment	Medium (.17)	Medium (.15)	Medium (.18)	Medium (.19)
CCM	Small (.05)	Small (.04)	Small (.05)	-
Comparison	Attachment[1]	Attachment[1]	Attachment[1]	Attachment[2]

Note. R^2 values excluding Step 1 included in brackets; Effect sizes denoted as small or medium; SSWss = solicitous support wanted as reported by support seekers; SSWcg = solicitous support wanted as perceived by caregivers; SSPss = solicitous support provided as perceived by support seekers; SSPcg = solicitous support provided as reported by caregivers.

[1]Models have a moderate effect size difference between them.

[2]One model produced statistically significant findings and the other did not.

Table 3.9

Single-item Variables: Correlations with Main Study Variables

	SS Satisfaction (N = 161)	CG Satisfaction (N = 164)	SS Skill (N = 162)	CG Skill (N = 161)	SS Comfort (N = 162)	CG Comfort (N = 163)
SS Satisfaction	–					
CG Satisfaction	.04	–				
SS Skill	.34***	.15*	–			
CG Skill	-.02	.01	.08	–		
SS Comfort	.12	.19*	.18*	.10	–	
CG Comfort	.03	.24***	.00	.29***	.28***	–
SS PCS	-.03	-.09	-.16*	.07	.04	.19*
CG PCS	.09	-.06	.09	-.06	.02	.12
SS Anxiety[a]	-.09	.02	-.17*	-.13	-.16*	.02
SS Avoidance[a]	-.11	.05	.25***	-.30***	-.31***	-.16*
CG Anxiety[a]	-.01	-.24***	-.06	-.06	-.16*	-.20*
CG Avoidance[a]	-.06	-.32***	-.09	.00	.02	-.15*

Note. SS = Support Seekers; CG = Caregivers; PCS = Pain Catastrophizing Scale score

[a]Measured using the Experiences in Close Relationships – Revised questionnaire (ECR-R).

*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 3.10

Study 1 Summary of Regression Analyses Predicting the Single-item Variables Using Attachment Variables

	Satisfaction		Skill		Comfort	
	SS Report	CG Perception	SS Report	CG Perception	SS Report	CG Perception
	β	β	B	β	β	β
Step 1						
SS Sex[a]						.21**
Rel. Length						.10
ΔR^2						.05**
Step 2						
SS Sex[a]	.06		-.10	.06	.04	.23**
Rel. Length	-.10		-.03	-.02	-.06	.10
SS Anxiety[b]	.10		-.06	-.01	-.06	.15
SS Avoidance[b]	.08		-.25**	-.30***	-.25**	-.17*
CG Anxiety[b]	-.19*		.07	.02	-.13	-.10
CG Avoidance[b]	-.28**		-.07	-.00	.12	-.18*
ΔR^2	.14***		.07*	.09**	.11***	.08**
R^2	.15***		.08*	.10**	.11**	.13***

Note. SS = Support Seekers; CG = Caregivers

[a]Sex (0 = male, 1 = female). [b]Measured using the Experiences in Close Relationships – Revised questionnaire (ECR-R).

*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 3.11

Study 1 Comparing Single-Item Follow-up Question Regression Models in Predicting Pain-Related Solicitous Support Variables

	SS Satisfaction	CG Satisfaction	SS Skill	CG Skill	SS Comfort	CG Comfort
Attachment	-	Medium (.14)	Small (.07)	Medium (.09)	Medium (.11)	Small (.08)
CCM	-	-	-	-	-	Small (.04)
Comparison	Equal	Attachment[2]	Attachment[2]	Attachment[2]	Attachment[2]	Equal

Note. R^2 values excluding Step 1 included in brackets; Effect sizes denoted as small or medium; SSWss = solicitous support wanted as reported by support seekers; SSWcg = solicitous support wanted as perceived by caregivers; SSPss = solicitous support provided as perceived by support seekers; SSPcg = solicitous support provided as reported by caregivers.
[1]Models have a moderate effect size difference between them.
[2]One model produced statistically significant findings and the other did not.

Table 4.1

Study 2 List of Hypotheses and Open Research Questions

Label	Hypotheses and Open Research Questions
H8	Support seeker anxiety will be positively associated with reports of solicitous support wanted.
H9	Support seeker avoidance will be negatively associated with reports of solicitous support wanted.
H10	Support seeker pain catastrophizing will be positively associated with reports of solicitous support wanted.
H11	Support seeker anxiety will be negatively associated with perceptions of solicitous support provided.
R7	No hypothesis proposed for support seeker avoidance and perceptions of solicitous support provided.
H12	Support seeker pain catastrophizing will be negatively associated with perceptions of solicitous support provided.
R8	No hypothesis proposed for the pain duration by pain catastrophizing interaction effect on solicitous support provided.

Table 4.2

Study 2 Descriptive Statistics (N = 147)

	Mean	*SD*	Score Range	*α*
Age[a]	49.46	13.51	18 – 83	-
Pain Duration[b]	10.03	9.50	.6 – 46	-
Pain Severity	6.18	1.91	1 – 10	.90
Pain Disability	5.59	2.13	0 – 9.57	.87
Attachment Anxiety[c]	3.27	1.27	.83 – 6.00	.71
Attachment Avoidance[c]	2.16	1.13	.5 – 5.67	.73
PCS	26.54	12.77	.00 – 52.00	.94
SSW[d]	3.09	.61	1 – 4.00	.88
SSP[d]	2.95	.73	1 – 4.00	.91

Note. PCS = Pain Catastrophizing Scale score; SSW = solicitous support wanted; SSP = solicitous support provided.
[a]Age (years). [b]Pain Duration (years). [c]Measured using the Experiences in Close Relationships – Revised questionnaire (ECR-R). [d]Measured using the Pain Response Questionnaire – Support Seeker Version (PRQ-SS).

Table 4.3

Study 2 Correlations between Demographic Variables, Attachment Variables, CCM Variables, and the PRQ Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Sex[a]	–										
2. Age	.00	–									
3. Relationship Length	.06	.75***	–								
4. Pain Duration	.11	.08	.05	–							
5. Pain Severity	.07	-.01	.00	.06	–						
6. Disability[b]	.17*	-.04	-.06	.05	.48***	–					
7. Attachment Anxiety[c]	.14	.05	.07	.09	.09	.20*	–				
8. Attachment Avoidance[c]	-.07	-.03	.00	.01	.09	.22**	.45***	–			
9. PCS	.05	-.06	.06	-.03	.28***	.40***	.42***	.35***	–		
10. SSW[d]	.40***	-.01	.06	.13	.08	.15	.14	-.13	.14	–	
11. SSP[d]	.04	.01	.04	-.05	-.06	-.13	-.31***	-.51***	-.24**	.21**	–

Note. PCS = Pain Catastrophzizng Scale score; SSW = Solicitous Support Wanted; SSP = Solicitous Support Provided
[a]Sex (0 = male, 1 = female). [b]Measured using the Pain Disability Index. [c]Measured using the Experiences in Close Relationships – Revised questionnaire (ECR-R). [d]Measured using the Pain Response Questionnaire – Support Seeker Version (PRQ-SS).
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 4.4

Study 2 Summary of Regression Analyses Predicting Solicitous Support Wanted and Provided Variables Using Attachment Variables

	Support Seeker Report							
	SSW[c]				SSP[c]			
	b	*SE b*	*β*		*b*	*SE b*	*β*	
Step 1								
Sex[a]	.46	.10	.37***		.10	.13	.07	
Relationship Length	.03	.05	.04		.02	.06	.03	
Pain Duration	.05	.05	.08		-.03	.06	-.05	
Pain Severity	.01	.05	.01		.01	.07	.01	
Disability	.05	.05	.09		-.11	.07	-.14	
ΔR^2				.17***				.03
Step 2								
Sex[a]	.42	.10	.34***		.04	.11	.03	
Relationship Length	.02	.05	.04		.03	.05	.05	
Pain Duration	.04	.05	.07		-.03	.05	-.04	
Pain Severity	.00	.05	.00		.00	.06	.00	
Disability	.06	.05	.11		-.01	.06	-.01	
Anxiety[b]	.09	.05	.15		-.08	.06	-.10	
Avoidance[b]	-.12	.05	-.19*		-.34	.06	-.46***	
ΔR^2				.03				.25***
R^2				.21***				
Step 4								
Sex[a]					.01	.12	.00	
Relationship Length					.03	.05	.04	
Pain Duration					-.12	.07	-.16	
Pain Severity					.00	.06	-.01	
Disability					-.01	.06	-.01	
Anxiety[b]					-.06	.06	-.09	
Avoidance[b]					-.37	.06	-.51***	
AnxXAvd					.00	.06	.00	
AnxXPain Duration					.06	.07	.09	
AvdXPain Duration					-.07	.08	-.12	
AnxXAvdXPainDuration					.09	.05	.25*	
ΔR^2								.02*
R^2								.30***

[a]Sex (0 = male, 1 = female). [b]Measured using the Experiences in Close Relationships – Revised questionnaire (ECR-R). [c]Measured using the Pain Response Questionnaire – Support Seeker Version (PRQ-SS).

*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 4.5

Study 2 Summary of Regression Analyses Predicting Solicitous Support Wanted and Provided Variables Using CCM Variables

	Support Seeker Report							
	SSW[b]				SSP[b]			
	b	*SE b*	*β*		*b*	*SE b*	*β*	
Step 1								
Sex[a]	.46	.10	.37***		.10	.13	.07	
Relationship Length	.03	.05	.04		.02	.06	.03	
Pain Duration	.05	.05	.08		-.03	.06	-.05	
Pain Severity	.01	.05	.01		.01	.07	.01	
Disability	.05	.05	.09		-.11	.07	-.14	
ΔR^2				.17***				.03
Step 2								
Sex[a]					.09	.13	.06	
Relationship Length					.04	.06	.05	
Pain Duration					-.04	.06	.05	
Pain Severity					.02	.07	.03	
Disability					-.05	.07	-.06	
PCS					-.17	.07	-.23**	
ΔR^2								.04**
R^2				.18***				.07

PCS = Pain Catastrophizing Scale score; SSW = Solicitous Support Wanted; SSP = Solicitous Support Provided

[a]Sex (0 = male, 1 = female). [b]Measured using the Pain Response Questionnaire – Support Seeker Version (PRQ-SS).

*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 4.6

Study 2 Comparing Attachment Theory and CCM Regression Models in Predicting Pain-Related Solicitous Support Variables

	SSW	SSP
Attachment	Small (.03)	Medium (.27)
CCM	-	Small (.04)
Comparison	Attachment[2]	Attachment[1]

Note. R^2 values excluding Step 1 included in brackets; Effect sizes denoted as small or medium; SSW = Solicitous Support Wanted; SSP = Solicitous Support Provided.
[1]Models have a moderate effect size difference between them.
[2]One model produced statistically significant findings and the other did not.

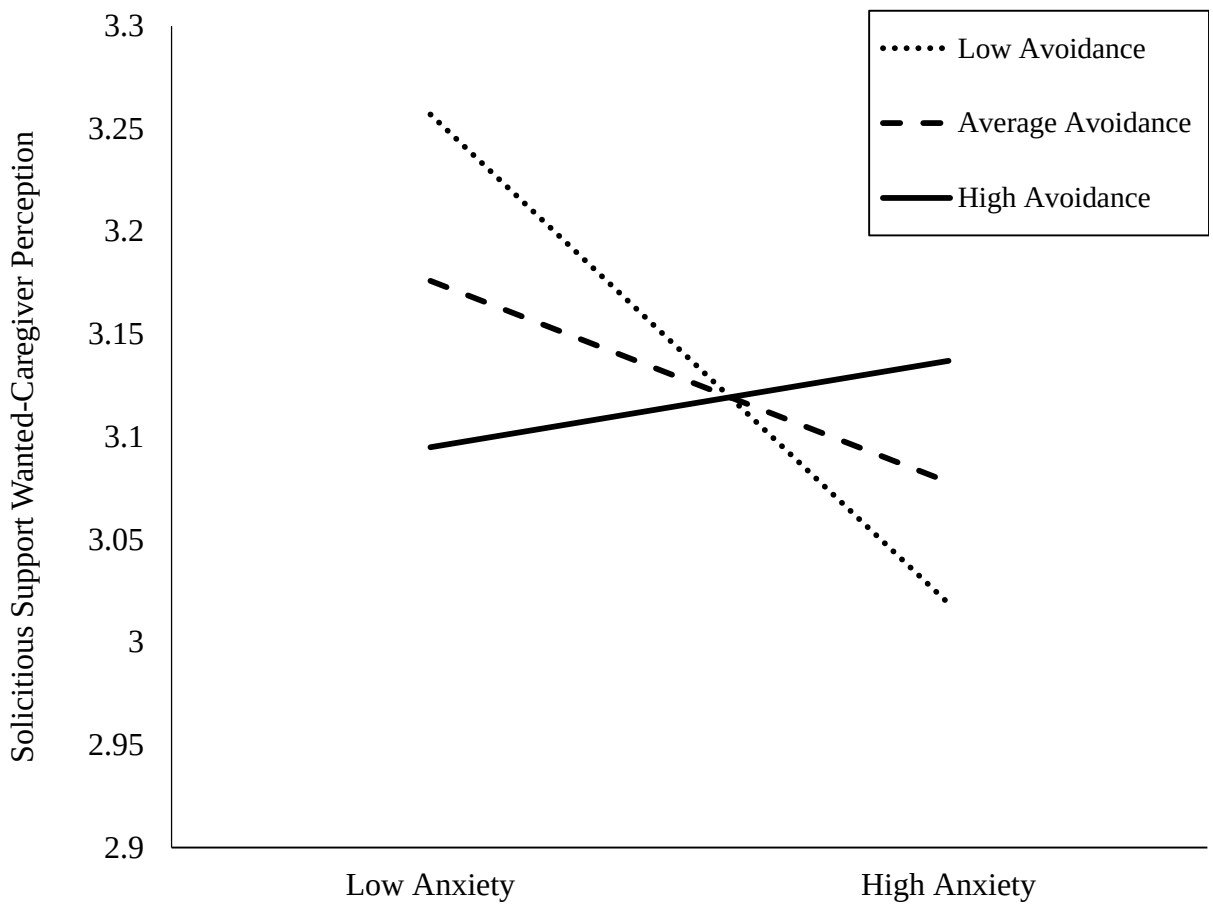

Figure 3.1. Study 1 Interaction Effect Involving Caregiver Attachment Anxiety and Avoidance Predicting Solicitous Support Wanted as Perceived by Caregivers in Study 1.

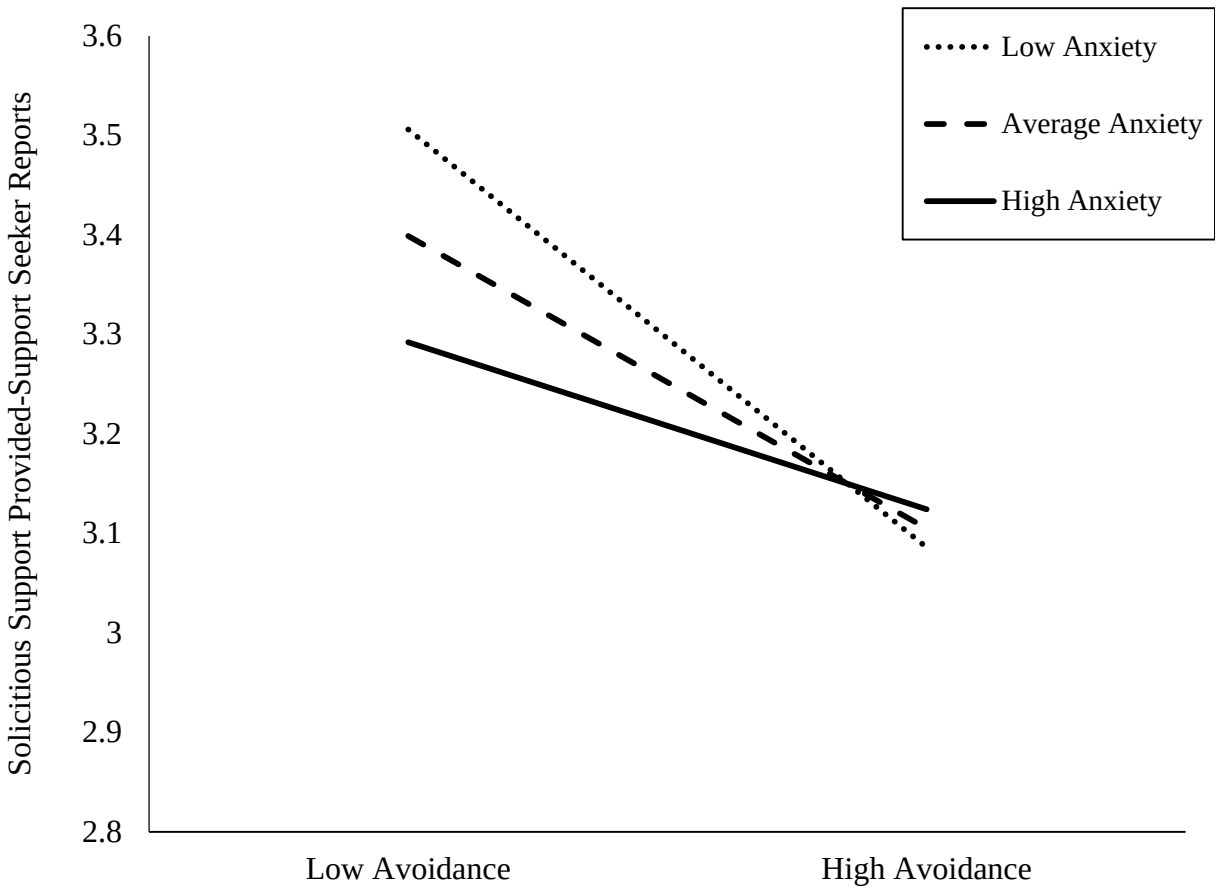

Figure 3.2. Study 1 Interaction Effect Involving Support Seeker Attachment Anxiety and Avoidance Predicting Solicitous Support Provided as Perceived by Support Seekers.

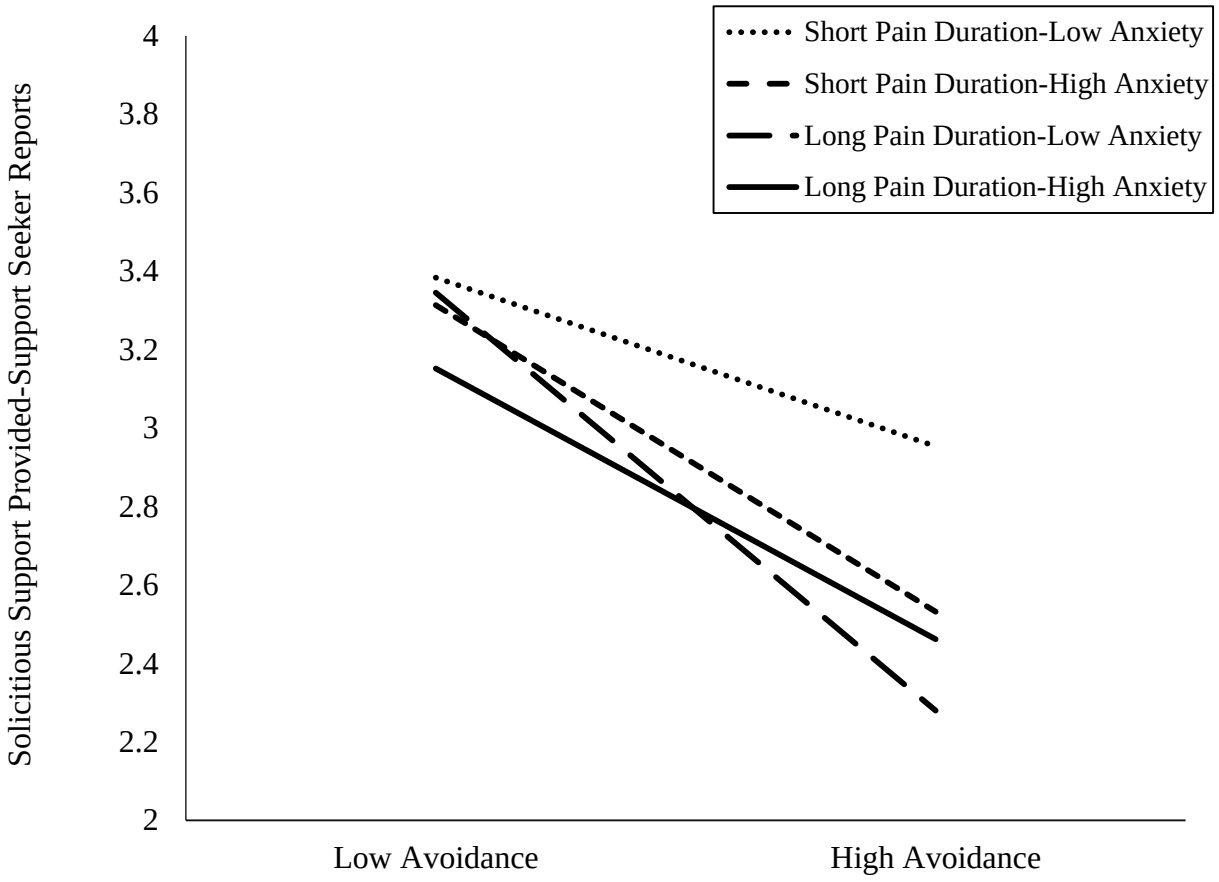

Figure 4.1. Study 2 Interaction Effect Involving Support Seeker Attachment Anxiety, Attachment Avoidance, and Pain Duration Predicting Solicitous Support Provided.

Appendix A: Study 1 Consent Form

UNIVERSITY OF SASKATCHEWAN

Participant Consent Form

You are invited to participate in a research study entitled: **Relationship Styles and Health**

Researcher: Connie Heidt, B.A.(Hons.)., Clinical Psychology Doctoral Graduate Student, Department of Psychology, University of Saskatchewan, 306-966-5735, connie.heidt@usask.ca

Supervisor: Dr. Lachlan McWilliams, Department of Psychology, University of Saskatchewan, 306-966-6966, Lachlan.mcwilliams@usask.ca

Purpose and Objective of the Research: The general purpose of this study is to examine how relationship styles are related to health variables. One of the specific objectives is to explore support seeking and caregiving related to the experience of pain in romantic couples.

Eligibility: To participate in this research you must be 18 years of age or older and be in a romantic relationship of at least 6 months. The study involves an online survey, so both you and your partner must have internet access. Since we are seeking information from both partners, we ask you to make your partner aware of the survey and encourage him or her to participate. To help with this, once you complete the survey, you will be asked if we can send an email on your behalf to invite them to participate in the survey.

Procedures: Participation involves completing an online survey. When you do this, you will be asked to provide an email address for your partner, so he or she can also be invited to participate in the survey. Both of you will be questioned about a range of everyday experiences, such as your health, personal characteristics, relationship style, and the way you respond to pain. Participation in this study is expected to take approximately 30-35 minutes.

Potential Risks: There are no known or anticipated risks or benefits to you by participating in this research. Responding to the types of questions included in this study should not cause anything beyond mild stress or discomfort. If you experience any distress or discomfort following your participation in this study, mental health services can be accessed in the community at Community Adult Mental Health available at 306-655-7777. Students can also access mental health services through Student Counselling Services at the University of Saskatchewan, 306-966-4920, 3rd Floor Place Riel. If you do not reside in Saskatoon, SK, it is recommended that you contact a local community mental health agency and inquire about available services.

Compensation: If both you and you partner participate, you will each be separately entered into a draw to win one of eight $100 visa gift cards as an honorarium for your participation in this study.

Confidentiality: In order for the researcher to link you and your partner's data, both members of each couple will be required to include their first name, the first name of their partner, and both of your email addresses. Once the data is linked, this personal information will be immediately deleted and no identifying information will be included with the data. The data collected from this study will first and foremost be used for a doctoral thesis in clinical psychology. However, the data collected is also intended to be used for academic journal articles, other research projects, and conference presentations.

We are attempting to gather information from both members of relationship couples. To do this, we will send your partner a link to the survey. As part of doing this, we need to make him or her aware that you also participated in the survey.

FluidSurveys is the survey tool used to collect participant data for this study. FluidSurveys allows for surveys to be made completely anonymous and secure. There are two features that can decrease anonymity, which is IP tracking or Track Country. Neither of these features are enabled for this study. FluidSurveys is a Canadian company and "is compliant with Canadian privacy (all the data resides on Canadian servers) and accessibility standards (W3C)."

Right to Withdraw: Your participation is voluntary and you can answer only those questions that you are comfortable with. You may withdraw from the research project for any reason, at any time without explanation or penalty of any sort. If you choose to withdraw your data (option available until point that the data has been pooled October 2016) it will be destroyed and will not be used. After this date, it is possible that the data has already been pooled and it may not be possible to withdraw your data

Follow up: To obtain results from the study, please email the researcher (Connie Heidt) at connie.heidt@usask.ca

Questions or Concerns: If you have any questions or concerns, please do not hesitate in contacting the researcher or supervisor using the information provided.

This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office ethics.office@usask.ca (306) 966-2975. Out of town participants may call toll free (888) 966-2975.

By completing and submitting the questionnaire, **YOUR FREE AND INFORMED CONSENT IS IMPLIED** and indicates that you understand the above conditions of participation in this study.

Appendix B: Introduction to Survey

Thank you for agreeing to participate in this study. Please answer each of the following questions. Some questions in this survey will require that you type in a number, write a response, or choose from a number of options to best describe your experience. Please respond to each question to the best of your ability. This study is intended to be completed independently, so please do not talk to your partner about the questions before answering them. Furthermore, it would be most appreciated if you and your partner do not talk about either of your answers to these questions until both of you have had a chance to complete the study.

Information to Link Romantic Couples and Assign Roles

In order to link your responses with your partners responses, please provide your first name

_____

Your partner's first name

_____

Your email address:

_____

You partners email address:

_____

All identifying information will be promptly deleted once romantic partner responses are linked and the prize draws have been made.

One member of each couple will answer questions related to receiving support during pain and the other member will answer questions related to providing pain-related support. Upcoming birthday will be used to determine which member of each couple will answer which set of questions.

What is your date of birth? MM-DD

What is your partner's date of birthday? MM-DD

Between yourself and your partner, whose birthday is coming up next?

My birthday is next

My partner's birthday is next

You and your partner's birthday information will be promptly deleted once romantic partner responses are linked.

Appendix C: Demographic Information Items

The first section consists of questions asking for background information about you. Please answer as honestly as possible, keeping in mind that your answers will remain confidential.

1. What is your sex:
   Female
   Male
2. Age: _____ years

3. Highest level of education? (please select one only):
   Below high school
   High school degree
   Some college/university
   Trade/technical/vocational training
   Bachelor's degree
   Master's degree
   PhD degree
   Professional degree (e.g. M.D., J.D., Psy.D.)
   Other advanced degree: _____

4. Geographic location? (please select one only): *
   Canada
   United States of America
   Other – Please specify: _____

5. Ethnic background? (Please select only one)
   Caucasian
   Aboriginal
   African
   African American
   Asian/Pacific Islander
   Latino/a
   Middle Eastern
   East Indian
   Other – Please specify: _____
   Would rather not say

6. Sexual orientation? Select one
   Exclusively heterosexual
   Primarily heterosexual
   More heterosexual than homosexual
   Bisexual
   More homosexual than heterosexual
   Primarily homosexual

Exclusively homosexual

7. What is your primary area of employment? (Please select one only):

Stay-at-home parent
Retired
Student
Unemployed
Agriculture, Forestry, Fishing, or Hunting
Arts, Entertainment, or Recreation
Broadcasting
Education - College, University, or Adult
Education - Primary/Secondary (K-12)
Education - (Other) Please Specify: _____
Construction
Finance and Insurance
Government and Public Administration
Health Care and Social Assistance
Hotel and Food Services
Information - Services and Data
Information - (Other) Please Specify: _____
Processing
Legal Services
Manufacturing - Computer and Electronics
Manufacturing - (Other) Please Specify: _____
Military
Mining
Publishing
Real Estate, Rental, or Leasing
Religious
Retail
Scientific or Technical Services
Software
Telecommunications
Transportation and Warehousing
Utilities
Wholesale
Other – Please specify: _____

8. What is your occupation? _____

Please answer the following questions with your **current** dating relationship in mind.
9. How many people have you dated exclusively for 6 months or longer? _____

10. At which one of the following stages would you place your **current** relationship (please select one only):

Casually dating (I date other people)
Seriously dating (I do not date other people)
I have thought about marriage, but I have not discussed it with my partner
We have discussed marriage, but made no formal plans
Engaged
Married and living together

11. Is your current relationship:
With a partner of the same sex as yourself (heterosexual)
With a partner of a different sex than yourself (homosexual)

12. Is your current relationship the most serious you have ever had?___ yes ___ no

13. Do you currently live in same household (e.g., house, apartment, condo, etc.) as your current partner?___ yes ___ no

If answered yes
Approximately how long have you lived together? _____ years _____ months

If answered no
How many times a month do you and your partner stay in the same household overnight? _____ months

14. How long have you and your partner known each other? _____ years _____ months

15. How long have you and your partner been together as a couple? ____ years ____ months

16. Using this scale:
1 – Extremely unlikely; 2 – Very unlikely; 3 – Unlikely; 4 – Unsure; 5 – Likely; 6 – Very likely; 7 – Extremely likely

What is the likelihood that you will still be in a relationship with the same partner in
A month: _____
Six months: _____
A year: _____
Five years: _____

17. If you are not currently married, can you see yourself marrying your current partner?
_____ yes _____ no

Appendix D: Pain History Scale

1. Do you have pain or discomfort that has persisted continuously or intermittently for longer than three months?
   Yes _____ No _____

Note: Participants who respond yes to this question will complete the following Pain History Items. Participants who respond no, will skip the Pain History Items and will begin completing Appendix D: Recent Experiences with Pain questions.

Next Page: Pain History Items

Referring to the pain that has persisted continuously or intermittently for longer than three months, please answer the following questions.

1. How long have you had this type of pain? _____ months.

2. Select the item that best represents the frequency of your pain.
   a) it is almost constant pain
   b) it occurs everyday, but not constantly
   c) it occurs almost everyday
   d) it occurs several days a week
   e) it occurs about once a week
   f) it occurs once a month

3. The following words can be used to describe pain intensity. Please consider the pain that you have on a continuous or intermittent basis, and check the box beside the word that best represents the average intensity of this pain.
   0 No pain
   1 Mild
   2 Discomforting
   3 Distressing
   4 Horrible
   5 Excruciating

4. What type of pain, do you experience on a continuous or intermittent basis? Please describe it in a few words (e.g., low back pain, headaches, arthritis, injury- related pain).

   _____

5. Have you ever consulted with a physician regarding this pain?

   Yes _____ No _____

Appendix E: Recent Experiences with Pain

In the past 4 weeks, have you ever experienced the following types of pain:

1. A headache/migraine Y/N
2. Back pain Y/N
3. Muscle pain Y/N
4. Dental/mouth/oral pain Y/N
5. Arm, leg, or joint (knee, hip, elbow, etc.) pain Y/N
6. Chest pain Y/N
7. Neck pain Y/N
8. Menstrual pain (women respond only) Y/N
9. Stomach cramps Y/N

If you have experienced any other type of pain in the past 4 weeks that was not included above, please list the type of pain you experienced below.

Below there is a list of experiences that typically involve pain. For each please indicate if you have ever in your lifetime had that type of experience and whether you have experienced it in the past year.

In a few cases, the experience may not have resulted in pain (e.g., a minor car accident in which you were not hurt). If you did not experience pain as the result of the event, do NOT report having the experience. In this section, we are only interested in events in which you experienced pain.

If you have had the experience several times, please report on the occurrence that was most painful.

Experience	Lifetime	Past year
Broken bone	Y/N	Y/N
Sprain	Y/N	Y/N
Dental work	Y/N	Y/N
Childbirth (women respond only)	Y/N	Y/N
Bike accident	Y/N	Y/N
Being hit by a motorized vehicle	Y/N	Y/N
An accident while in a motorized vehicle	Y/N	Y/N
Surgery	Y/N	Y/N
Getting hit, punched, or kicked in a fight	Y/N	Y/N
Accident at home, work, or elsewhere that involved an injury other than a broken bone or sprain	Y/N	Y/N

Getting hurt while participating in a recreational or sporting activity	Y/N	Y/N

There is a wide variety of different pain experiences that can occur, so it is impossible for us to provide an exhaustive list of all of the different pain experiences one can have. We want to know whether or not you experienced pain in the past year and whether the type of pain you experienced was included above.

Have you experienced pain in the past year and was this pain included in the above questions?

Yes, I experienced pain in the past year and the type of pain I experienced was reported above.

Yes, I experienced pain in the past year, but the type of pain I experienced was NOT reported above.

If answered yes to the preceding question, the following 3 questions are presented

1. How long ago did you experience this pain?
   _____
2. What type of pain did you experience?
   _____
3. How long did this pain last?
   _____

No, I did not experience pain in the past year.

If answered yes to the preceding question, the following 3 questions are presented

1. When was the last time you experienced any type of pain?
   _____
2. What type of pain did you experience?
   _____
3. How long did this pain last?
   _____

Appendix F: RAND 36-Item Short-Form Health Survey

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
1	2	3	4	5

2. Compared to one year ago, how would you rate your health in general now?

a. Much better now than one year ago
b. Somewhat better now than one year ago
c. About the same as one year ago
d. Somewhat worse now than one year ago
e. Much worse than one year ago

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much? **(Circle One Number on Each Line)**

	Yes, Limited a Lot	Yes, Limited a Little	No, Not limited at All
3. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	[1]	[2]	[3]
4. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	[1]	[2]	[3]
5. Lifting or carrying groceries	[1]	[2]	[3]
6. Climbing **several** flights of stairs	[1]	[2]	[3]
7. Climbing **one** flight of stairs	[1]	[2]	[3]
8. Bending, kneeling, or stooping	[1]	[2]	[3]
9. Walking **more than a mile**	[1]	[2]	[3]
10. Walking **several blocks**	[1]	[2]	[3]
11. Walking **one block**	[1]	[2]	[3]
12. Bathing or dressing yourself	[1]	[2]	[3]

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**? **(Circle One Number on Each Line)**

	Yes	No
13. Cut down the amount of time you spent on work or other activities	1	2
14. **Accomplished less** than you would like	1	2
15. Were limited in the **kind** of work or other activities	1	2

16. Had **difficulty** performing the work or other activities (for example, it took extra effort) 1 2

During the **past 4 weeks,** have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)? **(Circle One Number on Each Line)**

	Yes	No
17. Cut down the **amount of time** you spent on work or other activities	1	2
18. **Accomplished less** than you would like	1	2
19. Didn't do work or other activities as **carefully** as usual	1	2

20. During the **past 4 weeks,** to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups? **(Circle One Number)**

Not at all 1
Slightly 2
Moderately 3
Quite a bit 4
Extremely 5

21. How much **bodily** pain have you had during the **past 4 weeks**? **(Circle One Number)**

None 1
Very mild 2
Mild 3
Moderate 4
Severe 5
Very severe 6

22. During the **past 4 weeks,** how much did **pain** interfere with your normal work (including both work outside the home and housework)? **(Circle One Number)**

Not at all 1
A little bit 2
Moderately 3
Quite a bit 4
Extremely 5

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks** . . . **(Circle One Number on Each Line)**

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
23. Did you feel full of pep?	1	2	3	4	5	6
24. Have you been a very nervous person?	1	2	3	4	5	6
25. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
26. Have you felt calm and peaceful?	1	2	3	4	5	6
27. Did you have a lot of energy?	1	2	3	4	5	6
28. Have you felt downhearted and blue?	1	2	3	4	5	6
29. Did you feel worn out?	1	2	3	4	5	6
30. Have you been a happy person?	1	2	3	4	5	6
31. Did you feel tired?	1	2	3	4	5	6

32. During the **past 4 weeks,** how much of the time has your **physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)? **(Circle One Number)**

All of the time 1
Most of the time 2
Some of the time 3
A little of the time 4
None of the time 5

How TRUE or FALSE is <u>each</u> of the following statements for you?

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
33. I seem to get sick a little easier than other people	1	2	3	4	5
34. I am as healthy as anybody I know	1	2	3	4	5
35. I expect my health to get worse	1	2	3	4	5
36. My health is excellent	1	2	3	4	5

Appendix G: Alcohol Use Disorders Identification Test Questionnaire

Please circle the answer that is correct for you.

Questions	**0**	**1**	**2**	**3**	**4**
1. How often do you have a drink containing alcohol?*	Never	Monthly or less	2 - 4 times per month	2 - 3 times per week	4+ times per week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 - 2	3 - 4	5 - 6	7 - 9	10+
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
4. How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
5. How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
9. Have you or someone else been injured as a result of your drinking?	No		Yes, but not in the last year		Yes, during the last year
10. Has a relative, friend, doctor, or other health worker been concerned about your drinking or suggested that you	No		Yes, but not in the last		Yes, during the

should cut down?	year	last year

*Note: If participants answer 0 – Never for question #1 they will move on to Appendix H without completing the rest of the Alcohol Use Disorders Identification Test Questionnaire.

Appendix H: The Experiences in Close Relationships Questionnaires - Revised

The statements below concern how you feel in emotionally intimate relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it.

Question	Strongly Disagree		Neutral/ Mixed			Strongly Agree	
1. I prefer not to show a partner how I feel deep down.	1	2	3	4	5	6	7
2. I'm afraid that I will lose my partner's love.	1	2	3	4	5	6	7
3. I am very comfortable being close to romantic partners.	1	2	3	4	5	6	7
4. I worry a lot about my relationships.	1	2	3	4	5	6	7
5. It's not difficult for me to get close to my partner.	1	2	3	4	5	6	7
6. I worry that romantic partners won't care about me as much as I care about them.	1	2	3	4	5	6	7
7. I get uncomfortable when a romantic partner wants to be very close.	1	2	3	4	5	6	7
8. I often worry that my partner will not want to stay with me.	1	2	3	4	5	6	7
9. I don't feel comfortable opening up to romantic partners.	1	2	3	4	5	6	7
10. I often wish that my partner's feelings for me were as strong as my feelings for him or her.	1	2	3	4	5	6	7
11. I talk things over with my partner.	1	2	3	4	5	6	7
12. I often worry that my partner doesn't really love me.	1	2	3	4	5	6	7
13. I am nervous when partners get too close to me.	1	2	3	4	5	6	7
14. When my partner is out of sight, I worry that he or she might become interested in someone else.	1	2	3	4	5	6	7
15. I feel comfortable sharing my private thoughts and feelings with my partner.	1	2	3	4	5	6	7
16. My desire to be very close sometimes scares people away	1	2	3	4	5	6	7
17. I find it easy to depend on romantic partners.	1	2	3	4	5	6	7
18. When I show my feelings for romantic partners, I'm afraid they will not feel the same way about me.	1	2	3	4	5	6	7

19. I find it relatively easy to get close to my partner.	1	2	3	4	5	6	7
20. I rarely worry about my partner leaving me.	1	2	3	4	5	6	7
21. I find it difficult to allow myself to depend on romantic partners.	1	2	3	4	5	6	7
22. I do not often worry about being abandoned.	1	2	3	4	5	6	7
23. I prefer not to be too close to romantic partners.	1	2	3	4	5	6	7
24. My romantic partner makes me doubt myself.	1	2	3	4	5	6	7
25. I tell my partner just about everything.	1	2	3	4	5	6	7
26. I find that my partner(s) don't want to get as close as I would like.	1	2	3	4	5	6	7
27. I usually discuss my problems and concerns with my partner.	1	2	3	4	5	6	7
28. Sometimes romantic partners change their feelings about me for no apparent reason.	1	2	3	4	5	6	7
29. I feel comfortable depending on romantic partners.	1	2	3	4	5	6	7
30. I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.	1	2	3	4	5	6	7
31. It's easy for me to be affectionate with my partner.	1	2	3	4	5	6	7
32. It makes me mad that I don't get the affection and support I need from my partner.	1	2	3	4	5	6	7
33. It helps to turn to my romantic partner in times of need.	1	2	3	4	5	6	7
34. I worry that I won't measure up to other people.	1	2	3	4	5	6	7
35. My partner really understands me and my needs.	1	2	3	4	5	6	7
36. My partner only seems to notice me when I'm angry.	1	2	3	4	5	6	7

Appendix I: Relationship Questionnaire

Following are four general relationship styles that people often report. Please choose one of these four styles that best describes you or is closest to the way you are.

____ A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

____ B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

____ C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

____ D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

Now please rate each of the relationship styles above to indicate how well or poorly each description corresponds to your general relationship style.

Style A

1	2	3	4	5	6	7
Disagree strongly			Neutral/Mixed			Strongly Agree

Style B

1	2	3	4	5	6	7
Disagree strongly			Neutral/Mixed			Strongly Agree

Style C

1	2	3	4	5	6	7
Disagree strongly			Neutral/Mixed			Strongly Agree

Style D

1	2	3	4	5	6	7
Disagree strongly			Neutral/Mixed			Strongly Agree

Appendix J: Ten-Item Personality Inventory

Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

Disagree strongly	Disagree moderately	Disagree a little	Neither agree or disagree	Agree a little	Agree moderately	Strongly agree
1	2	3	4	5	6	7

I see myself as:
1. _____ Extraverted, enthusiastic
2. _____ Critical, quarrelsome
3. _____ Dependable, self-disciplined
4. _____ Anxious, easily upset
5. _____ Open to new experiences, complex
6. _____ Reserved, quiet
7. _____ Sympathetic, warm
8. _____ Disorganized, careless
9. _____ Calm, emotionally stable
10. _____ Conventional, uncreative

Appendix K: Pain Catastrophizing Scale

PCS

Everyone experiences painful situations at some point in their lives. Such experiences may include headaches, tooth pain, joint or muscle pain. People are often exposed to situations that may cause pain such as illness, injury, dental procedures or surgery.

We are interested in the types of thoughts and feeling that you have when you are in pain. Listed below are thirteen statements describing different thoughts and feelings that may be associated with pain. Using the scale, please indicate the degree to which you have these thoughts and feelings when you are experiencing pain.

Using the following scale, please indicate the degree to which you have these thoughts and feelings when you are experiencing pain.

0 – Not at all **1** – To a slight degree **2** – To a moderate degree **3** – To a great degree **4** – All the time

When I'm in pain . . .

1. ____ I worry all the time about whether the pain will end.
2. ____ I feel I can't go on.
3. ____ It's terrible and I think it's never going to get any better.
4. ____ It's awful and I feel that it overwhelms me.
5. ____ I feel I can't stand it anymore.
6. ____ I become afraid that the pain will get worse.
7. ____ I keep thinking of other painful events.
8. ____ I anxiously want the pain to go away.
9. ____ I can't seem to keep it out of my mind.
10. ____ I keep thinking about how much it hurts.
11. ____ I keep thinking about how badly I want the pain to stop.
12. ____ There's nothing I can do to reduce the intensity of the pain.
13. ____ I wonder whether something serious may happen

Appendix L: Relationship Assessment Scale

Please mark the letter for each item that best answers that item for you.

1. How well does your partner meet your needs?

1	2	3	4	5
Poorly		Average		Extremely Well

2. In general, how satisfied are you with your relationship?

1	2	3	4	5
Unsatisfied		Average		Extremely Satisfied

3. How good is your relationship compared to most?

1	2	3	4	5
Poor		Average		Excellent

4. How often do you wish you hadn't gotten in this relationship?

1	2	3	4	5
Never		Average		Very often

5. To what extent has your relationship met your original expectations?

1	2	3	4	5
Hardly at all		Average		Completely

6. How much do you love your partner?

1	2	3	4	5
Not much		Average		Very much

7. How many problems are there in your relationship?

1	2	3	4	5
Very few		Average		Very many

Appendix M: Pain Response Questionnaire – Support Seeker Version

The statements on this page include ways that your partner (spouse or significant other) could respond to you when he or she knows you are in pain. We are interested in two things. First, to what extent would you want your partner to respond this way? Second, to what extent does he or she actually respond this way? Using the scales below, please indicate how strongly you agree or disagree with each statement.

1 Strongly Disagree
2 Disagree
3 Agree
4 Strongly Agree

When I am in pain

	I want my partner to do this	My partner actually does this
1. help me with whatever I am doing.	1 2 3 4	1 2 3 4
2. encourage me to keep going.	1 2 3 4	1 2 3 4
3. ask me about my pain.	1 2 3 4	1 2 3 4
4. finish the job that I started.	1 2 3 4	1 2 3 4
5. tell me that I can cope with the pain.	1 2 3 4	1 2 3 4
6. do nice things to make me feel better.	1 2 3 4	1 2 3 4
7. offer me help.	1 2 3 4	1 2 3 4
8. distract me from my pain.	1 2 3 4	1 2 3 4
9. encourage me to rest.	1 2 3 4	1 2 3 4
10. stop me from talking about my pain.	1 2 3 4	1 2 3 4
11. try to keep me involved in activities.	1 2 3 4	1 2 3 4
12. ask if I need help.	1 2 3 4	1 2 3 4
13. tell me to keep active.	1 2 3 4	1 2 3 4
14. treat me with extra care and concern.	1 2 3 4	1 2 3 4
15. change topics when I talk about my pain.	1 2 3 4	1 2 3 4
16. offer suggestions about managing or reducing the pain.	1 2 3 4	1 2 3 4
17. offer to give me a massage.	1 2 3 4	1 2 3 4
18. try to help me stay positive.	1 2 3 4	1 2 3 4
19. try to take my mind off the pain by turning on the T.V. or music.	1 2 3 4	1 2 3 4
20. tell me not to talk about my pain.	1 2 3 4	1 2 3 4
21. ignore my pain.	1 2 3 4	1 2 3 4
22. offer to get me pain medication.	1 2 3 4	1 2 3 4
23. say he or she is concerned.	1 2 3 4	1 2 3 4
24. tell me to take it easy.	1 2 3 4	1 2 3 4
25. let me do things alone until I ask for help.	1 2 3 4	1 2 3 4
26. try to prevent me from getting upset.	1 2 3 4	1 2 3 4
27. offer to get me something to eat or drink.	1 2 3 4	1 2 3 4
28. suggest ways to stop me from making my pain worse.	1 2 3 4	1 2 3 4
29. be willing to listen to me talk about my pain.	1 2 3 4	1 2 3 4

30. tell me I can do things despite pain.	1	2	3	4	1	2	3	4
31. help me out.	1	2	3	4	1	2	3	4
32. take good care of me.	1	2	3	4	1	2	3	4
33. seem interested in my pain.	1	2	3	4	1	2	3	4
34. suggest fun or interesting activities that will not make my pain much worse.	1	2	3	4	1	2	3	4
35. be available if I want help.	1	2	3	4	1	2	3	4
36. tell me that I can handle the pain well.	1	2	3	4	1	2	3	4
37. act like I am not in pain.	1	2	3	4	1	2	3	4
38. tell me not to strain myself.	1	2	3	4	1	2	3	4
39. help me ignore the pain.	1	2	3	4	1	2	3	4

Appendix N: Pain Response Questionnaire – Caregiver Version

The statements on this page describe ways that your partner (spouse or significant other) might want you to respond when he or she is in pain (or is in particularly severe pain). We are interested in two things. First, to what extent do you believe your partner wants you to respond this way? Second, to what extent do you actually respond this way? Using the scales below, please indicate how strongly you agree or disagree with each statement.

1 Strongly Disagree
2 Disagree
3 Agree
4 Strongly Agree

When my partner is in pain

	My partner wants me to do this				I actually do this			
1. help my partner with whatever he/she is doing.	1	2	3	4	1	2	3	4
2. encourage my partner to keep going.	1	2	3	4	1	2	3	4
3. ask my partner about his/her pain.	1	2	3	4	1	2	3	4
4. finish the job that my partner started.	1	2	3	4	1	2	3	4
5. tell my partner that he/she can cope with the pain.	1	2	3	4	1	2	3	4
6. do nice things to make my partner feel better.	1	2	3	4	1	2	3	4
7. offer my partner help.	1	2	3	4	1	2	3	4
8. distract my partner from his/her pain.	1	2	3	4	1	2	3	4
9. encourage my partner to rest.	1	2	3	4	1	2	3	4
10. stop my partner from talking about his/her pain.	1	2	3	4	1	2	3	4
11. try to keep my partner involved in activities.	1	2	3	4	1	2	3	4
12. ask if my partner needs help.	1	2	3	4	1	2	3	4
13. tell my partner to keep active.	1	2	3	4	1	2	3	4
14. treat my partner with extra care and concern.	1	2	3	4	1	2	3	4
15. change topics when my partner talks about his/her pain.	1	2	3	4	1	2	3	4
16. offer suggestions about managing or reducing his/her pain.	1	2	3	4	1	2	3	4
17. offer to give my partner a massage.	1	2	3	4	1	2	3	4
18. try to help my partner stay positive.	1	2	3	4	1	2	3	4
19. try to take his/her mind off the pain by turning on the T.V. or music.	1	2	3	4	1	2	3	4
20. tell my partner not to talk about his/her pain.	1	2	3	4	1	2	3	4
21. ignore my partner's pain.	1	2	3	4	1	2	3	4
22. offer to get my partner pain medication.	1	2	3	4	1	2	3	4
23. say I am concerned.	1	2	3	4	1	2	3	4
24. tell my partner to take it easy.	1	2	3	4	1	2	3	4
25. let my partner do things alone until he/she asks for help.	1	2	3	4	1	2	3	4
26. try to prevent my partner from getting upset.	1	2	3	4	1	2	3	4
27. offer to get my partner something to eat or drink.	1	2	3	4	1	2	3	4
28. suggest ways to stop my partner from making his/her pain worse.	1	2	3	4	1	2	3	4
29. be willing to listen to my partner talk about his/her pain.	1	2	3	4	1	2	3	4

30. tell my partner he/she can do things despite pain.	1	2	3	4	1	2	3	4
31. help my partner out.	1	2	3	4	1	2	3	4
32. take good care of my partner.	1	2	3	4	1	2	3	4
33. seem interested in my partner's pain.	1	2	3	4	1	2	3	4
34. suggest fun or interesting activities that will not make my partner's pain much worse.	1	2	3	4	1	2	3	4
35. be available if my partner wants help.	1	2	3	4	1	2	3	4
36. tell my partner that he/she can handle the pain well.	1	2	3	4	1	2	3	4
37. act like my partner is not in pain.	1	2	3	4	1	2	3	4
38. tell my partner not to strain himself/herself.	1	2	3	4	1	2	3	4
39. help my partner ignore his/her pain.	1	2	3	4	1	2	3	4

Appendix O: Single Item and Open-Ended Questions

Support Seeker Questions

1. How satisfied are you with the support you receive from your partner during episodes of pain?

Very unsatisfied	Moderately unsatisfied	Somewhat unsatisfied	Somewhat satisfied	Moderately satisfied	Very satisfied
1	2	3	4	5	6

2. Please explain your rating. That is, please explain why you are satisfied or dissatisfied with the support you receive from your partner during episodes of pain.

3. How skilled does your partner seem to be at knowing when you are experiencing pain?

Very unskilled	Moderately unskilled	Somewhat unskilled	Somewhat skilled	Moderately skilled	Very skilled
1	2	3	4	5	6

4. Please explain how you let your partner know when you are experiencing pain.

5. How comfortable are you asking for help from your partner when you are in pain?

Very uncomfortable	Moderately uncomfortable	Somewhat uncomfortable	Somewhat comfortable	Moderately comfortable	Very comfortable
1	2	3	4	5	6

6. Please explain your rating. That is, please explain why you are or are not comfortable asking for help from your partner when you are in pain.

Caregiver Questions

1. How satisfied do you think your partner is with the support he or she receives when experiencing an episode of pain?

Very unsatisfied	Moderately unsatisfied	Somewhat unsatisfied	Somewhat satisfied	Moderately satisfied	Very satisfied
1	2	3	4	5	6

2. Please explain your rating. That is, please explain why you think your partner is satisfied or dissatisfied with the support he or she receives when experiencing an episode of pain.

3. How difficult or easy is it to know when your partner is experiencing pain?

Very difficult	Moderately difficult	Somewhat difficult	Somewhat easy	Moderately easy	Very easy
1	2	3	4	5	6

4. Please explain how you know when your partner is experiencing pain?

5. How comfortable does your partner seem to be directly asking for help when he or she is in pain?

Very uncomfortable	Moderately uncomfortable	Somewhat uncomfortable	Somewhat comfortable	Moderately comfortable	Very comfortable
1	2	3	4	5	6

6. Please explain how you decide what type of support to provide to your partner when he or she is experiencing an episode of pain?

Appendix P: Satisfaction with Life Scale

Below are five statements that you may agree or disagree with. Using the scale below, indicate your agreement with each item. Please be open and honest in your responding.

7 - Strongly agree
6 - Agree
5 - Slightly agree
4 - Neither agree nor disagree
3 - Slightly disagree
2 - Disagree
1 - Strongly disagree

____ In most ways my life is close to my ideal.
____ The conditions of my life are excellent.
____ I am satisfied with my life.
____ So far I have gotten the important things I want in life.
____ If I could live my life over, I would change almost nothing.

Appendix Q: Sleep Impairment Index – Modified

1. Please rate how severely you currently experience each of the following sleep problems.

	None	Mild	Moderate	Severe	Very Severe
Difficulty falling asleep:	1	2	3	4	5
Difficulty staying asleep:	1	2	3	4	5
Problem waking up too early:	1	2	3	4	5

2. How satisfied/dissatisfied are you with your current sleep pattern?

Very satisfied		Moderately satisfied		Very dissatisfied
1	2	3	4	5

3. To what extent does your current sleep pattern interfere with your daily functioning (e.g., daytime fatigue, ability to function at work/daily chores, concentration, memory, mood, etc.)?

Not at all	A little	Somewhat	Much	Very Much
1	2	3	4	5

Appendix R: Email Request Question

Since we are seeking information from both partners, we ask you to make your partner aware of the survey and encourage him or her to participate. To help with this, we ask your permission to send an email on your behalf to invite them to participate in the survey?

_____ yes ___ no

Appendix S: Study 1 Debriefing Form

UNIVERSITY OF SASKATCHEWAN

Participant Debriefing Form

Thank you for your participation in the study entitled, **Relationship Styles and Health.**

There is a renewed interest in the social factors and/or processes relevant to the experience of pain. Two approaches will be compared in their ability to understand the social aspects of the experience of pain by looking at what individuals want and receive in terms of social support from both members of a romantic couple. One approach, the communal coping model of pain catastrophizing [1], is arguably the best-known for looking at the social aspects of the pain experience. This approach suggests that how much individuals experience rumination, magnification, and helplessness during their pain experiences influences how individuals communicate their pain and how those close to them perceive their pain communication. However, another approach, attachment theory [2], has emerged as a promising avenue of investigation. This approach is based on the idea that experiences in childhood with parents or caregivers results in different types of attachment. These different attachment types have been found to influence how individuals communicate their pain and how those close to them perceive their pain communication.

The results of this research are expected to highlight potential benefits related to using attachment theory as a way to understanding the social processes involved during pain. In addition, the results will help develop a more comprehensive approach to the social aspects of the pain experience by integrating the communal coping model of pain catastrophizing into an attachment theory approach. Current psychological theory and treatment related to pain is based on the communal coping model of pain catastrophizing. Incorporation of attachment theory may assist with conceptualization and inform intervention planning and delivery, and result in better treatments for individuals with chronic pain.

Data collected from this study will first and foremost be used for a doctoral thesis in clinical psychology. However, this data may also be used for academic journal articles, other research projects, and conference presentations.

If you have any questions or would like to obtain the study results when they are completed, please do not hesitate to contact the researcher or supervisor listed below.

Researcher: Connie Heidt, B.A. (Hons.)., Clinical Psychology Doctoral Graduate Student, Department of Psychology, University of Saskatchewan, 306-966-5735, connie.heidt@usask.ca

Supervisor: Dr. Lachlan McWilliams, Department of Psychology, University of Saskatchewan, 306-966-6966, Lachlan.mcwilliams@usask.ca

References: [1] Sullivan, M., Thorn, B., Haythornthwaite, J., Keefe, F., Martin, M., Bradley, L., & Lefebvre, J. (2001). Theoretical perspectives on the relation between catastrophizing and pain. *Clin J Pain, 17*, 52-64 [2] Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment.* London: Penguin Books.

Appendix T: Study 2 Information Letter

Investigators:
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Lachlan McWilliams, Ph.D., R. Psych.
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You are being invited to take part in a research project at the Multidisciplinary Pain Centre.

We are trying to evaluate a new questionnaire to study social support preferences in people with chronic pain.

We are asking you to fill out a survey that includes questions about your pain experiences, the new questionnaire, and several other questionnaires about pain and your relationships. The entire survey should take about 25 minutes to complete.

The information that we receive from the survey will allow us to study the new measure. We will then use what we learn to help other scientists and health care workers improve their knowledge and practice by publishing what we learn in scientific journals.

If you have any questions about the questionnaires, or if you do not understand any questions, please let us know. We will be happy to help you understand them.

If you decide to not answer these questionnaires, it will not affect the help you receive at the Multidisciplinary Pain Centre. If you choose to take part in this study, you will be given $5.00 to compensate you for the time that you take to fill out the questionnaires.

There are no new treatments for your pain that will be given as part of this study.
If you would like to know the results found from your questionnaires, Dr. Dick will be happy to talk to you about them.

All information will be kept confidential (or private), except when professional codes of ethics or legislation (or the law) requires reporting.

Only the researchers and their research assistant will see the answers from your questionnaires.

The information you provide will be kept for at least five years after the study is done. The information will be kept in a locked filing cabinet. Your name or any other identifying information will not be attached to the information you gave. Your name will also never be used in any presentations or publications of the study results.

The information gathered for this study may be looked at again in the future to help us answer other study questions. If so, the ethics board will first review the study to ensure the information is used ethically. If you have any concerns about any aspect of the study, please contact the Patient Concerns Office of Capital Health at (780) 342-8080.

Appendix U: Study 2 Consent Form

Title of Project: Evaluating the Pain Response Questionnaire, an Expanded Measure of Pain-Related Support.

Part 1: Researcher Information

Name of Principal Investigator: Bruce D. Dick, Ph.D., R. Psych.
Affiliation: Associate Professor, Department of Anesthesiology and Pain Medicine
Contact Information: 407-1097

Name of Co-Investigator/Supervisor: Lachlan Mc Williams, Ph.D.
Affiliation: Associate Professor, Department of Psychology, Acadia University
Contact Information: (902) 585-1495

Part 2: Consent of Subject

	Yes	No
Do you understand that you have been asked to be in a research study?		
Have you read and received a copy of the attached information sheet?		
Do you understand the benefits and risks involved in taking part in this research study?		
Have you had an opportunity to ask questions and discuss the study?		
Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason and it will not affect your care.		
Has the issue of confidentiality been explained to you? Do you understand who will have access to the information you provide?		

Part 3: Signatures

This study was explained to me by:_____
Date:_____

I agree to take part in this study.
Signature of Research Participant:_____
Printed Name:_____

Witness (if available):_____
Printed Name:_____

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.
Researcher:_____
Printed Name:_____
* A copy of this consent form must be given to the subject.

By signing the consent form, you give permission to the study staff to access any personally identifiable health information which is under the custody of other health care professionals as deemed necessary for the conduct of the research.

If you have any concerns about any aspect of the study, please contact the Patient Concerns Office of Capital Health at (780) 342-8080.

Appendix V: Demographic Information Items

Please answer the following background questions.

1. How old are you? _____ years

2. Gender? ____ male ____female

3. Racial background?
   Caucasian
   Native Canadian
   Black
   Asian
   Other (*please specify*):_____

4. Please specify your marital status.
   Single - not involved in a relationship
   Single - involved in a relationship
   Divorced or Separated - not involved in a relationship
   Divorced or Separated - involved in a relationship
   Widowed - not involved in a relationship
   Widowed - involved in a relationship
   Married
   Living Common-Law

5. If you are currently in a relationship (married, living common-law, dating), please indicate the length of this relationship. ___ years and ___ months.

6. Please indicate your employment status.
   Employed full time
   Employed part time
   Unemployed
   Retired
   On sick leave or medical leave

Appendix W: Pain and Medical History

The following questions are about the pain related to the problem you are attending the pain clinic for.

1. Please describe your current problem in a few words (e.g., low back pain, headaches, arthritis, joint pain, injury-related pain). _____

2. Do you know the medical cause of your pain? ___yes ___no
   If ***YES***, What is your diagnosis? _____
   Who provided this diagnosis?: ___Family Doctor ___ Other (*please specify*):_____

3. How many months or years have you had your current pain problem?_____

4. Is this the first time you have had this pain condition? ___yes ___no
   If ***NO***, please explain:_____

5. How did your current pain problem begin?
   - Motor vehicle accident
   - Accident at home
   - Accident at work
   - Other accident
   - Pain just began (without injury)
   - After an illness
   - Other (*please specify*): _____

6. Are you participating in a Workers Compensation Board (WCB) program or another return to work program? ___yes ___no

7. Where do you experience the **most** pain? **Please check only one.** If you cannot decide which location has the most pain, please select the area in which your pain first occurred.
   - Head, face, mouth
   - Neck (cervical) region
   - Shoulders
   - Arms, hands
   - Chest
   - Abdominal Region
   - Upper back
   - Lower back, lumbar spine
   - Legs, feet
   - Pelvic region
   - Hips
   - Genital region
   - Other (*please specify*): _____

8. If you have pain in other areas as well, **please check all that apply.**
    Head, face, mouth
    Neck (cervical) region
    Shoulders
    Arms, hands
    Chest
    Abdominal Region
    Upper back
    Lower back, lumbar spine
    Legs, feet
    Pelvic region
    Hips
    Genital region
    Other (*please specify*): _____

9. Which statement best describes your pain experience?
    Always present - Always the same intensity.
    Always present - Intensity varies.
    Often present - Have short periods without pain.
    Often present - Have pain-free periods lasting 1 to 6 hours.
    Often present - Have pain-free periods lasting more than 6 hours.
    Occasionally present - Have pain daily, lasting a few minutes to an hour.
    Occasionally present - Have pain daily, lasting a few seconds to a few minutes.
    Infrequently present - Have pain every few days or weeks.

10. Do you have difficulty reading or understanding what you read? (please circle) Yes / No

11. Do you have difficulty reading or understanding written English? (please circle) Yes / No

Appendix X: Short-Form McGill Pain Questionnaire (S-MPQ)

The purpose of this checklist is for you to give us an idea about what your pain feels like. Each of the words in the left column describes a quality or characteristic that pain can have. For each word, please place a check mark in that row that tells us how much (none, mild, moderate, or severe) of that specific quality your pain has.

	None	Mild	Moderate	Severe
1. THROBBING				
2. SHOOTING				
3. STABBING				
4. SHARP				
5. CRAMPING				
6. GNAWING				
7. HOT-BURNING				
8. ACHING				
9. HEAVY				
10. TENDER				
11. SPLITTING				
12. TIRING-EXHAUSTING				
13. SICKENING				
14. FEARFUL				
15. PUNISHING-CRUEL				

Please rate your **current pain**, by circling a number on the following scale:

0 1 2 3 4 5 6 7 8 9 10

No Pain Worst Pain Imaginable

Please rate your **worst pain** over the past **week** on the following scale:

0 1 2 3 4 5 6 7 8 9 10

No Pain Worst Pain Imaginable

Please rate your **least pain** over the past **week** on the following scale:

0 1 2 3 4 5 6 7 8 9 10

No Pain Worst Pain Imaginable

Please rate your **average** over the past **week** on the following scale:

0 1 2 3 4 5 6 7 8 9 10

No Pain Worst Pain Imaginable

Appendix Y: Pain Disability Index

The rating scales below are designed to measure the degree to which aspects of your life are disrupted by chronic pain. In other words, we would like to know how much pain is preventing you from doing what you would normally do or from doing it as well as you normally would. Respond to each category indicating the *overall* impact of pain in your life, not just when pain is at its worst.

For each of the 7 categories of life activity listed, please circle the number on the scale that describes the level of disability you typically experience. A score of 0 means no disability at all, and a score of 10 signifies that all of the activities in which you would normally be involved have been totally disrupted or prevented by your pain.

If you think a category does not apply to you, circle "0"

Family/Home Responsibilities. This category refers to activities of the home or family. It includes chores or duties performed around the house (e.g. yard work) and errands or favors for other family members (e.g. driving the children to school).

0 1 2 3 4 5 6 7 8 9 10
No Disability Worst Disability

Recreation. This disability includes hobbies, sports, and other similar leisure time activities.

0 1 2 3 4 5 6 7 8 9 10
No Disability Worst Disability

Social Activity. This category refers to activities, which involve participation with friends and acquaintances other than family members. It includes parties, theater, concerts, dining out, and other social functions.

0 1 2 3 4 5 6 7 8 9 10
No Disability Worst Disability

Occupation. This category refers to activities that are part of or directly related to one's job. This includes non-paying jobs as well, such as that of a housewife or volunteer.

0 1 2 3 4 5 6 7 8 9 10
No Disability Worst Disability

Sexual Behavior. This category refers to the frequency and quality of one's sex life.

0 1 2 3 4 5 6 7 8 9 10
No Disability Worst Disability

Self Care. This category includes activities, which involve personal maintenance and

independent daily living (e.g. taking a shower, driving, getting dressed, etc.)

0 1 2 3 4 5 6 7 8 9 10

No Disability Worst Disability

Life-Support Activities. This category refers to basic life supporting behaviors such as eating, sleeping and breathing.

0 1 2 3 4 5 6 7 8 9 10

No Disability Worst Disability

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Appendix Z: Experiences in Close Relationships Scale-Short Form

Instruction: The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Mark your answer using the following rating scale:

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

___ 1. It helps to turn to my romantic partner in times of need.
___ 2. I need a lot of reassurance that I am loved by my partner.
___ 3. I want to get close to my partner, but I keep pulling back.
___ 4. I find that my partner(s) don't want to get as close as I would like.
___ 5. I turn to my partner for many things, including comfort and reassurance.
___ 6. My desire to be very close sometimes scares people away.
___ 7. I try to avoid getting too close to my partner.
___ 8. I do not often worry about being abandoned.
___ 9. I usually discuss my problems and concerns with my partner.
___ 10. I get frustrated if romantic partners are not available when I need them.
___ 11. I am nervous when partners get too close to me.
___ 12. I worry that romantic partners won't care about me as much as I care about them.

Appendix AA: Chronic Pain Acceptance Questionnaire

Below you will find a list of statements. Please rate the truth of each statement as it applies to you. Use the following rating scale to make your choices. For instance, if you believe a statement is 'Always True,' you would write a 6 in the blank next to that statement.

0	1	2	3	4	5	6
Never True	Very Rarely true	Seldom True	Sometimes True	Often True	Almost Always True	Always True

___ 1. I am getting on with the business of living no matter what my level of pain is.
___ 2. My life is going well, even though I have chronic pain.
___ 3. It's OK to experience pain.
___ 4. I would gladly sacrifice important things in my life to control this pain better.
___ 5. It's not necessary for me to control my pain in order to handle my life well.
___ 6. Although things have changed, I am living a normal life despite my chronic pain.
___ 7. I need to concentrate on getting ride of my pain.
___ 8. There are many activities I do when I feel pain.
___ 9. I lead a full life even though I have chronic pain.
___ 10. Controlling my pain is less important than any other goals in my life.
___ 11. My thoughts and feelings about pain must change before I can take important steps in my life.
___ 12. Despite the pain, I am now sticking to a certain course in my life.
___ 13. Keeping my pain level under control takes first priority whenever I'm doing something.
___ 14. Before I can make any serious plans, I have to get some control over my pain.
___ 15. When my pain increases, I can still take care of my responsibilities.
___ 16. I will have better control over my life if I can control my negative thoughts about pain.
___ 17. I avoid putting myself in situations where my pain might increase.
___ 18. My worries and fears about what pain will do to me are true.
___ 19. It's a great relief to realize that I don't have to change my pain to get on with life.
___ 20. I have to struggle to do things when I have pain.

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Appendix BB: Study 2 Debriefing Form

Please read this form. If you would like to keep this information, please do so.

DEBRIEFING

The purpose of the study you just took part in was to test a new self-report measure. This measure was created to see what people prefer and expect when it comes to pain-related social support. You also filled out questionnaires on ways you usually think and behave. You were asked to answer these questions so that we can see if there is a link between your answers to them and your answers to the new self-report measure. This will help us see if the scores on these measures related in the expected way.

Thank you for your assistance. If you have any questions about this study, please contact Dr. Bruce Dick at the address and/or number below.

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